



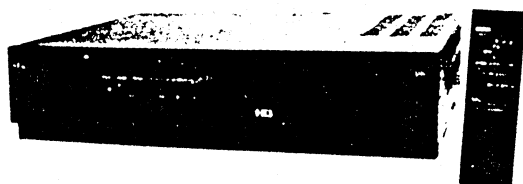
MODEL N9033G
MODEL N9034G

COLOR VIDEO CASSETTE RECORDER SERVICE MANUAL

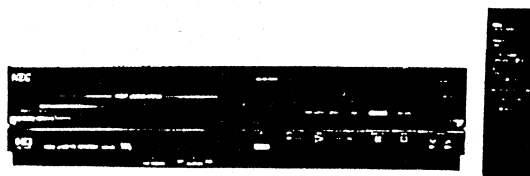
PARTS NO. 549-91-0339



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MODEL N9033G

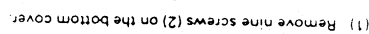


MODEL N9034G

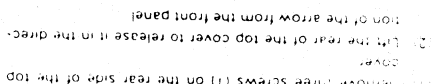
SPECIFICATIONS

Format	: VHS PAL standard	Horizontal resolution	: 250 lines (N9033G) 250 lines with the SHARPNESS control at center position. (N9034G)
Recording system	: Rotary, slant azimuth two-head helical scan system	Audio	
Video signal system	: PAL colour and CCIR mono-chrome signal, 625 lines.	Input	: -8 dBs, 47k ohms unbalanced
Tape width	: 12.65 mm (1/2 inch)	Output	: -6 dBs, high impedance load
Tape speed	: 23.39 mm/s	S/N ratio	: More than 40 dB
Maximum recording time	: 240 min. with E-240 video cassette	Frequency range	: 70 Hz to 10,000 Hz
Temperature operating	: 5°C to 40°C (41°F to 104°F)	Timer	: Weekly 2-event (N9033G) Maximum 21-day/4-event (N9034G)
storage	: -20°C to 60°C (-4°F to 140°F)	Dimensions	: 430 mm (W) x 105 mm (H) x 375 mm (D) (16-15/16" x 4-9/64" x 14-3/4")
Channel coverage	VL : 47-118 MHz	Weight	: 7.4 kg
Antenna output	VH : 118-300 MHz	Provided accessories	: Remote control unit Antenna cable Size UM-3 batteries (2 pieces)
	U : 470-862 MHz		
Power consumption	: 32 Watts		
Power requirement	: 220 ~, 50/60 Hz		
Video			
Input	: 0.5 to 2.0 Vp-p, 75 ohms unbalanced		
Output	: 1.0 ± 0.1 Vp-p, 75 ohms unbalanced		
S/N ratio	: More than 43 dB		

Design and specifications subject to change without notice.

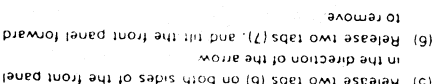


1-2. BOTTOM COVER



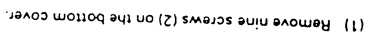
1-1 TOP COVER

7. REMOVING THE CASE (N9034G)

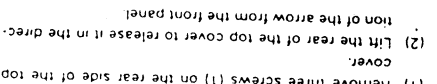


(4) Remove two screws (5)

1-3. FRONT PANEL

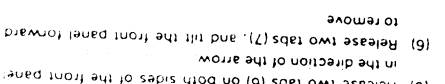


1-2. BOTTOM COVER



1-1. TOP COVER

1. REMOVING THE CASE (N9033G)



1-3. FRONT PANEL

DISASSEMBLY

SE (N9033G)

DISASSEMBLY

2-12	Capstan motor	1-14
2-16	Brake levers	1-17
2-17	Pinch arm sub assembly	1-17
2-18	Tension regulation band assembly	1-18
2-19	Adjusting the tension regulation band assembly	1-19
2-20	Supply reel disk	1-20
2-21	Take-up reel disk	1-21
2-22	Adjustments when replacing the supply and take-up reels	1-22
2-23	Tension regulation arm assembly	1-23
2-24	Measuring and checking the FWD reel torque	1-24
2-25	Measuring and checking the braking torque	1-25
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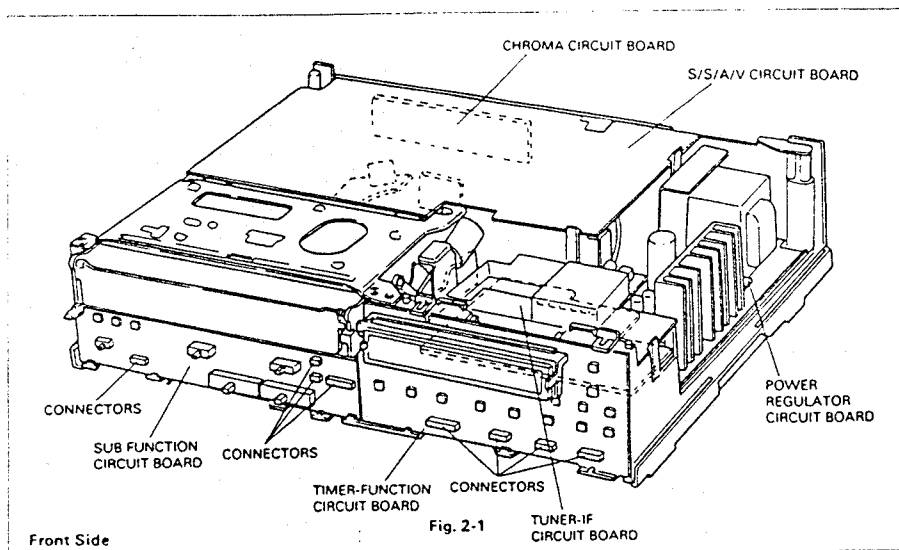
DISASSEMBLY	
1. REMOVING THE CASE (N9033G)	1-1. Top cover
	1-2. Bottom cover
	1-3. Front panel
1. REMOVING THE CASE (N9034G)	1-1. Top cover
	1-2. Bottom cover
	1-3. Front panel
2. CIRCUIT BOARD LOCATIONS	
2-1. Top view (N9033G)	1-1. Top cover
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2. CIRCUIT BOARD LOCATIONS	
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2-2. Bottom view (N9034G)	1-2. Bottom cover
3. REMOVING THE CIRCUIT BOARDS (N9033G)	
3-1. Sub function circuit board	1-1. Top cover
3-2. Timer-function circuit board	1-2. Bottom cover
3-3. S/S/A/V circuit board	1-3. Front panel
3. REMOVING THE CIRCUIT BOARDS (N9034G)	
3-1. Sub function circuit board	1-1. Top cover
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3-3. S/S/A/V circuit board	1-3. Front panel
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4. REMOVING THE CASSETTE MECHANISM	
4-1. Removing the cassette housing assembly	1-1. Top cover
4-2. Front cover	1-2. Bottom cover
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1. MECHANICAL ADJUSTMENT (N9033G)	
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1-2-2. Mechanism parts locations	1-1. Top cover
1-2-3. Before disassembling parts on the chassis	1-2. Bottom cover
1-4. Before adjusting the mechanism	1-3. Front panel
1-5. Servicing precautions	1-1. Top cover
1-6. Replacement of upper rotating drum assembly	1-2. Bottom cover
1-7. Replacement of drum assembly	1-3. Front panel
1-8. Replacement of ground plate	1-1. Top cover
1-9. Audio/control head	1-2. Bottom cover
1-10. Full erase head	1-3. Front panel
1-11. Intermediate roller and sub assembly	1-1. Top cover
1-12. Intermediate roller	1-2. Bottom cover
1-13. Slat base/TV slant base sub assembly	1-3. Front panel

EXPLODED VIEWS	DESCRIPTION	QTY
5-1	Capacitor section	3.47
5-2	Class A section	3.48
5-3	Mechanism (II) section (N9033G)	3.49
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5-6	Capacitor housing section	3.55
5-7	Wireless remote control section	3.58
5-8	Accessories	3.59
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5-11	Accessories	3.59
5-12	Accessories	3.59
5-13	Accessories	3.59
5-14	Accessories	3.59
5-15	Accessories	3.59
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5-100	Accessories	3.59

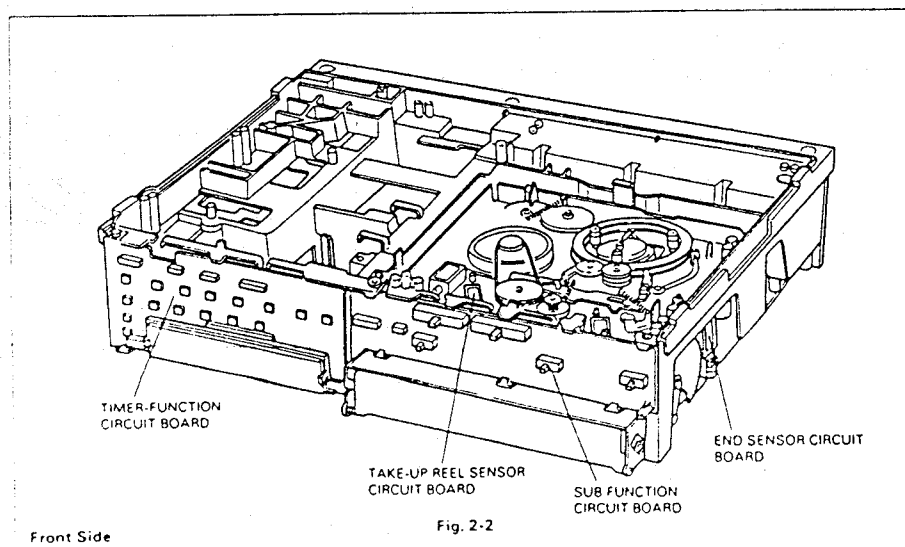
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2. CIRCUIT BOARD LOCATIONS

2-1. TOP VIEW (N9034G)

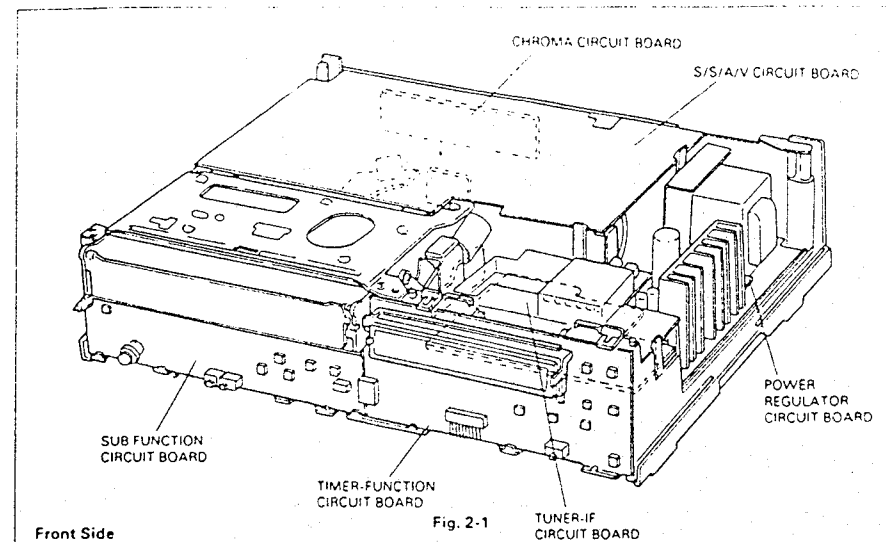


2-2. BOTTOM VIEW (N9034G)

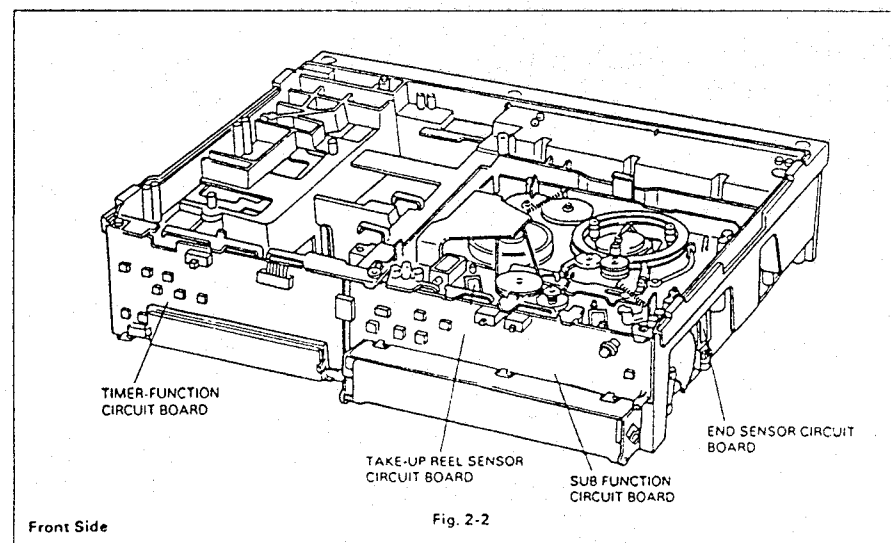


2. CIRCUIT BOARD LOCATIONS

2-1. TOP VIEW (N9033G)



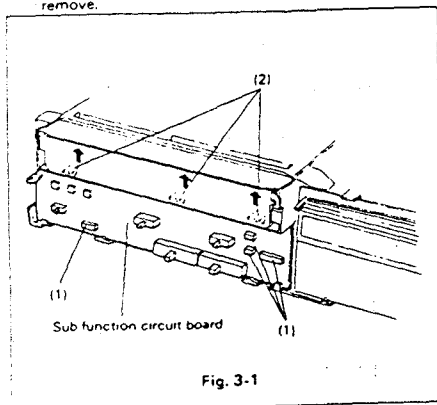
2-2. BOTTOM VIEW (N9033G)



3. REMOVING THE CIRCUIT BOARDS (N9034G)

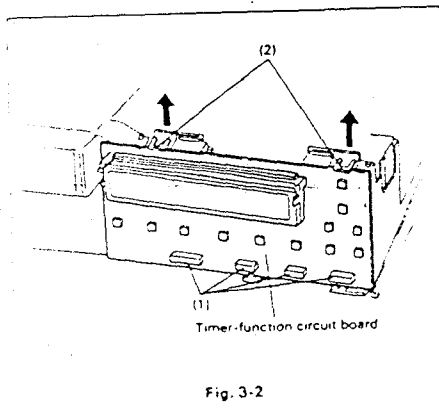
3-1. SUB FUNCTION CIRCUIT BOARD

- (1) Remove the top cover and front panel. (Refer to Items 1-1 and 1-3.)
- (2) Disconnect four wire connectors (1) from the circuit board.
- (3) Release three tabs (2) on the top of the circuit board in the direction of the arrow, and lift the circuit board to remove.



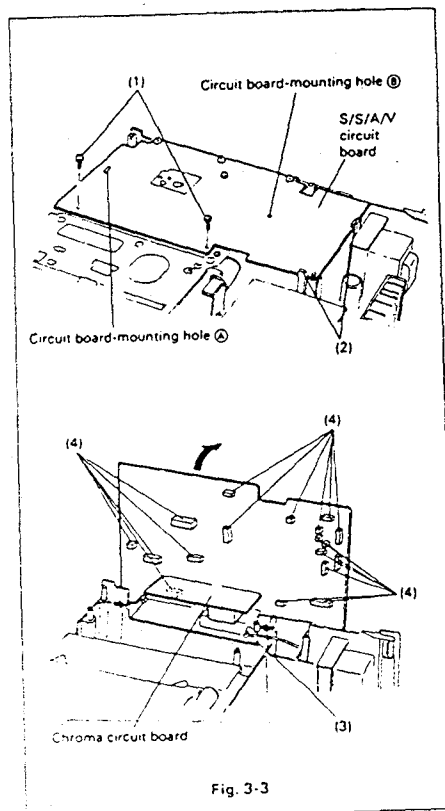
3-2. TIMER-FUNCTION CIRCUIT BOARD

- (1) Remove the top cover and front panel. (Refer to Items 1-1 and 1-3.)
- (2) Disconnect four wire connectors (1) from the circuit board.
- (3) Release two tabs (2), and lift the circuit board to remove.



3-3. S/S/A/V CIRCUIT BOARD

- (1) Remove the top cover. (Refer to Item 1-1.)
- (2) Remove two screws (1).
- (3) Release two tabs (2), and lift the S/S/A/V circuit board toward the rear panel.
- (4) Disconnect 75-ohm VHF cable (3) from the circuit block.
- (5) Disconnect 18 connectors (4) from the circuit board.
- (6) Disconnect the lead wire (gray).
- (7) Push the stoppers located at both sides of the jack terminals on the S/S/A/V circuit board toward the inside (indicated by the arrows), and pull the circuit board toward the rear to remove. (Refer to Fig. 3-3.)



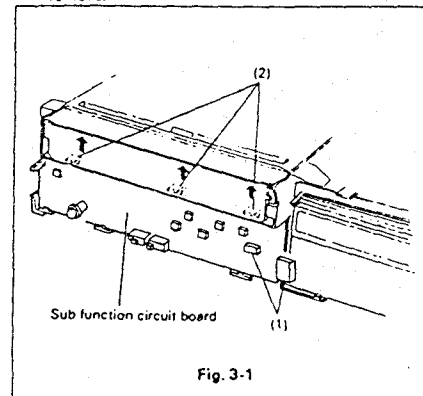
Notes:

1. The S/S/A/V circuit board and chroma circuit board are connected by a connector.
2. To install the circuit board, align the circuit board-mounting pins with mounting holes (A) and (B).

3. REMOVING THE CIRCUIT BOARDS (N9033G)

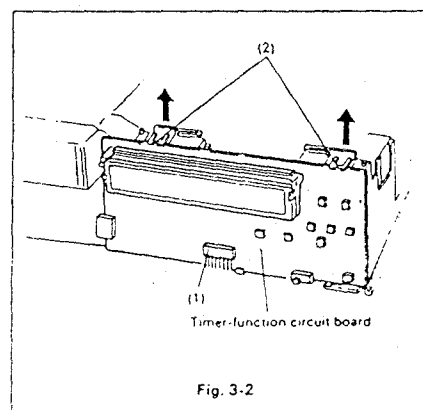
3-1. SUB FUNCTION CIRCUIT BOARD

- (1) Remove the top cover and front panel. (Refer to Items 1-1 and 1-3.)
- (2) Disconnect two wire connectors (1) from the circuit board.
- (3) Release three tabs (2) on the top of the circuit board in the direction of the arrow, and lift the circuit board to remove.



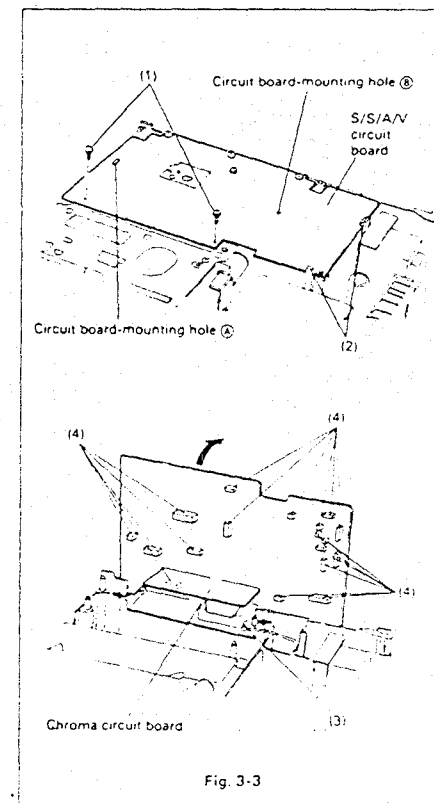
3-2. TIMER-FUNCTION CIRCUIT BOARD

- (1) Remove the top cover and front panel. (Refer to Items 1-1 and 1-3.)
- (2) Disconnect wire connector (1) from the circuit board.
- (3) Release two tabs (2), and lift the circuit board to remove.



3-3. S/S/A/V CIRCUIT BOARD

- (1) Remove the top cover. (Refer to Item 1-1.)
- (2) Remove two screws (1).
- (3) Release two tabs (2), and lift the S/S/A/V circuit board toward the rear panel.
- (4) Disconnect 75-ohm VHF cable (3) from the circuit block.
- (5) Disconnect 18 connectors (4) from the circuit board.
- (6) Disconnect the lead wire (gray).
- (7) Push the stoppers located at both sides of the jack terminals on the S/S/A/V circuit board toward the inside (indicated by the arrows), and pull the circuit board toward the rear to remove. (Refer to Fig. 3-3.)

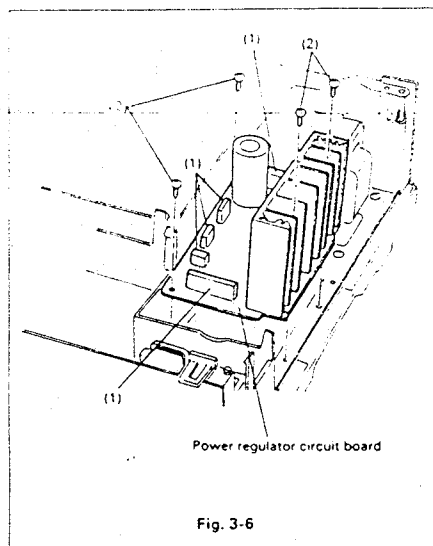


Notes:

1. The S/S/A/V circuit board and chroma circuit board are connected by a connector.
2. To install the circuit board, align the circuit board-mounting pins with mounting holes (A) and (B).

3-6. POWER REGULATOR CIRCUIT BOARD

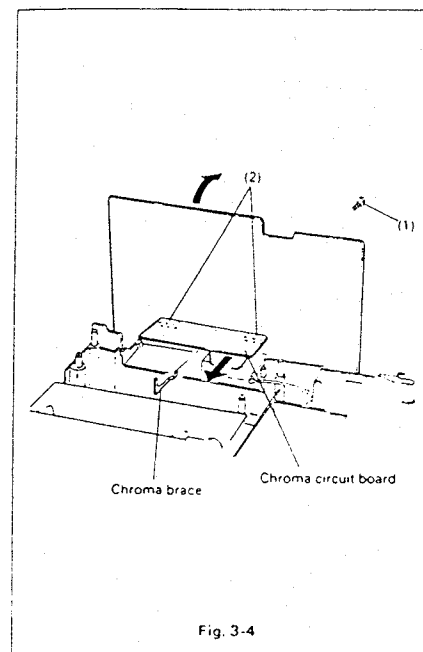
- (1) Remove the top cover. (Refer to Item 1-1.)
- (2) Remove the tuner-IF block according to the tuner-IF circuit board removal procedure. (Refer to steps 2 through 5, Item 3-5.) Place the unit on its left side.
- (3) Disconnect five connectors (1) from the power regulator block.
- (4) Remove four screws (2).



3-4. CHROMA CIRCUIT BOARD (N9033G/N9034G)

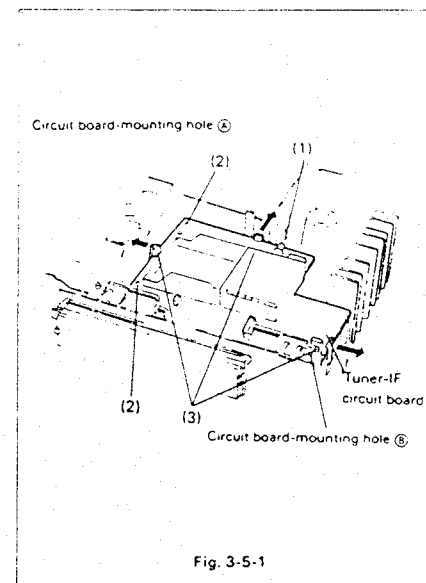
- (1) Remove the top cover. (Refer to Item 1-1.)
- (2) Perform steps (2) and (3) of the S/S/A/V circuit board removal procedure. (Refer to Item 3-3.)
- (3) Remove screw (1) from the chroma brace.
- (4) Carefully lift the chroma circuit board from connector (2) on the S/S/A/V circuit board.

Note: The chroma circuit board is connected to the S/S/A/V circuit board by a connector.

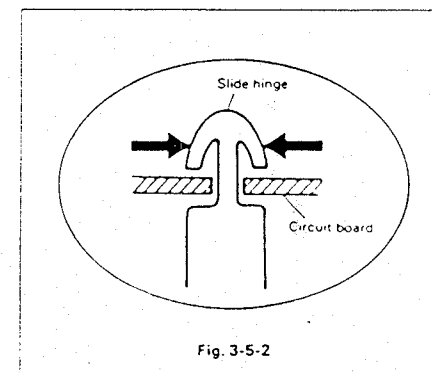


3-5. TUNER-IF CIRCUIT BOARD

- (1) Remove the top cover. (Refer to Item 1-1.)
- (2) Disconnect the 75-ohm RF cable (1).
- (3) Disconnect three connectors from the circuit board.
- (4) Release the circuit board from two slide hinges (2).
- (5) Release three tabs (3) in the direction of the arrow, and remove the circuit board.



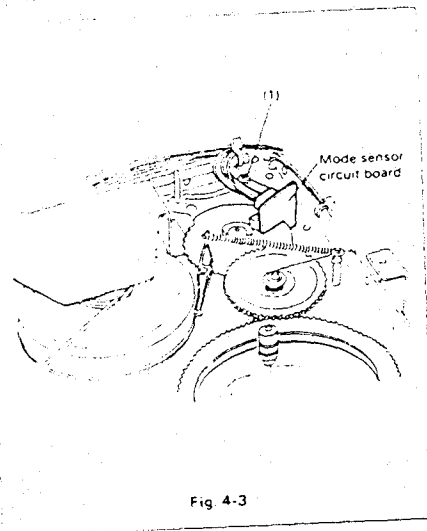
To install the circuit board, align the circuit board-mounting pins with mounting holes (A) and (B).



Note: When removing the circuit board from each slide hinge, use pliers to nip these hinges in the directions of the arrows shown in the figure to release.

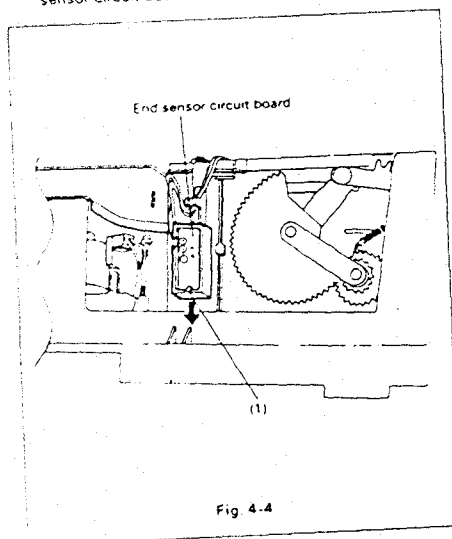
4-3. MODE SENSOR CIRCUIT BOARD

- (1) Remove the bottom cover. (Refer to Item 1-2.)
- (2) Remove screw (1).



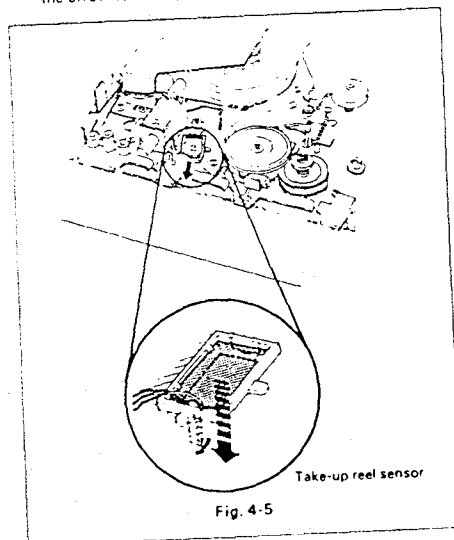
4-4. END SENSOR CIRCUIT BOARD

- (1) Remove the top cover. (Refer to Item 1-1.)
- (2) Release tab (1) toward the bottom, and lift the end sensor circuit board to remove.



4-5. TAKE-UP REEL SENSOR CIRCUIT BOARD

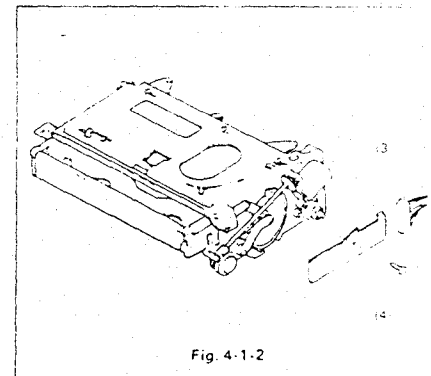
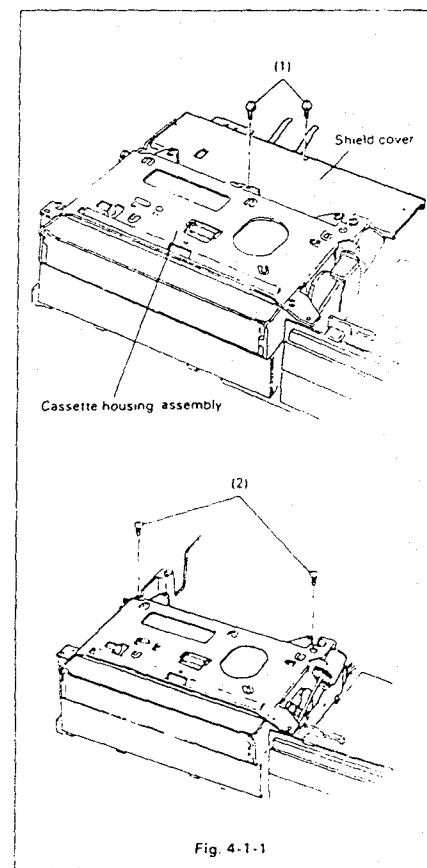
- (1) Remove the top cover. (Refer to Item 1-1.)
- (2) Remove the bottom cover. (Refer to Item 1-2.)
- (3) Remove the front panel. (Refer to Item 1-3.)
- (4) Follow the S/S/A/V circuit board removal procedure. (Refer to steps (2) and (3) in Item 3-3.)
- (5) Remove the shield cover and follow the mechanism assembly removal procedure. (Refer to Item 1-2-1 of ADJUSTMENT SECTION.)
- (6) Remove the cassette housing assembly. (Refer to Item 4-1.)
- (7) Remove the take-up reel disk assembly. (Refer to Item 1-21 of ADJUSTMENT SECTION.)
- (8) Lift the take-up sensor circuit board in the direction of the arrow to remove.



4. REMOVING THE CASSETTE MECHANISM

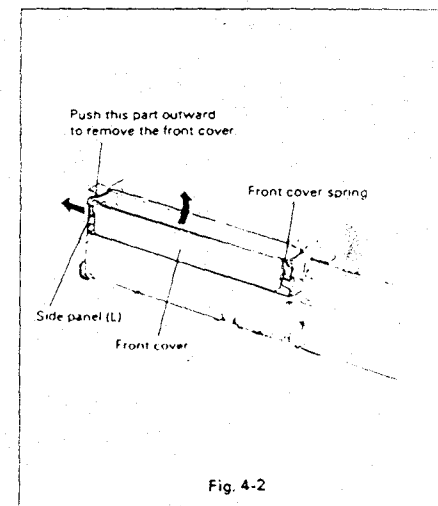
4-1. REMOVING THE CASSETTE HOUSING ASSEMBLY

- (1) Remove the top cover and front panel. (Refer to Items 1-1 and 1-3.)
- (2) Perform steps (2) and (3) of the S/S/A/V circuit board removal procedure. (Refer to Item 3-3.)
- (3) Remove two screws (1) and remove the shield cover.
- (4) Remove two screws (2). Pull up the rear part of the cassette housing assembly and pull backwards 4 ~ 5 mm carefully to release the claw of the front side of the cassette housing assembly from the chassis. Then carefully pull it out upwards.
- (5) Disconnect connector (3).
- (6) To remove the cassette loading circuit board, remove screw (4).



4-2. FRONT COVER

- (1) Push the front cover into the cassette housing.
- (2) Push the side panel (L) outward, and remove the front cover, together with the front cover spring.



1-2. MECHANISM ASSEMBLY

1-2-1 Removing the mechanism assembly

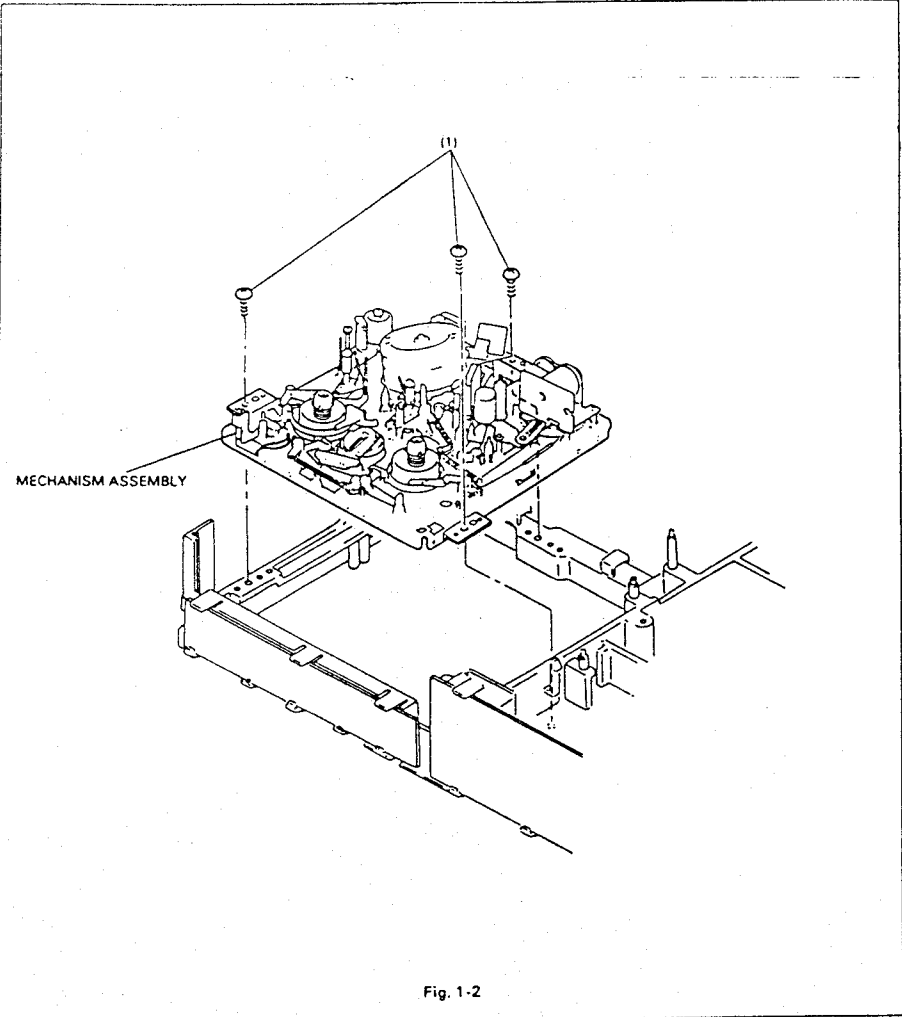
- (1) Remove the top cover and front panel. (Refer to Items 1-1 and 1-3)

(2) Perform steps (2) and (3) of the S/S/A/V circuit board removal procedure. (Refer to Item 3-3)

(3) Remove the shield cover and cassette housing assembly. (Refer to Item 4-1)
- (4) Disconnect three wire connectors and two lead wires (grey) of the rotary drum assembly from the circuit board.

(5) Remove the screw of the lead wire with earth lug. Disconnect eleven wire connectors of the other mechanical assembly parts from the circuit board.

(6) Remove three screws (1).



ADJUSTMENT

1. MECHANICAL ADJUSTMENT (N9033G)

1-1. SERVICING JIGS AND TOOLS

J-1 Checking mirror For tape flow check and adjustment procedures 16950871	J-2 Hexagonal driver For guide roller screw 16951281	J-3 Adjustment driver For guide roller 16951291	J-4 Adjustment driver For tapered pin of ACE head 16951301
J-5 Box driver For ACE head, guide pole and reverse pin 16951311	J-6 Alignment tape (MH-2) Overall adjusting of picture quality and tracking MH-2 79V20196	J-7 Cleaning liquid (isopropyl alcohol) Cleaning cloth for cleaning 16950001	J-8 Head demagnetizer demagnetizing audio heads
J-9 Cleaning cassette tape For cleaning video heads	J-10 Torque meter 79V20195 150g/cm Torque meter (79V20200) 600g/cm (Torque gauge head) 79V21508	J-11 Back Tension cassette Gauge 79V20202	J-12 Height Gauge A Jig 16951372
J-13 Master Plane B Jig 16951381	J-14 Master Plane A Jig 16951361	J-15 Height Gauge B Jig 16951391	J-16 Cassette tape (E-120) For checking tape path

Note: The items identified by *mark in the list are not stocked in warehouse.

Fig. 1-1

1-3. BEFORE DISASSEMBLING PARTS ON THE CHASSIS

Do not turn the adjusting screws shown below when removing adjacent parts.

- (1) Supply guide pole height adjusting screw.

(2) Take-up/supply guide roller height adjusting screw.

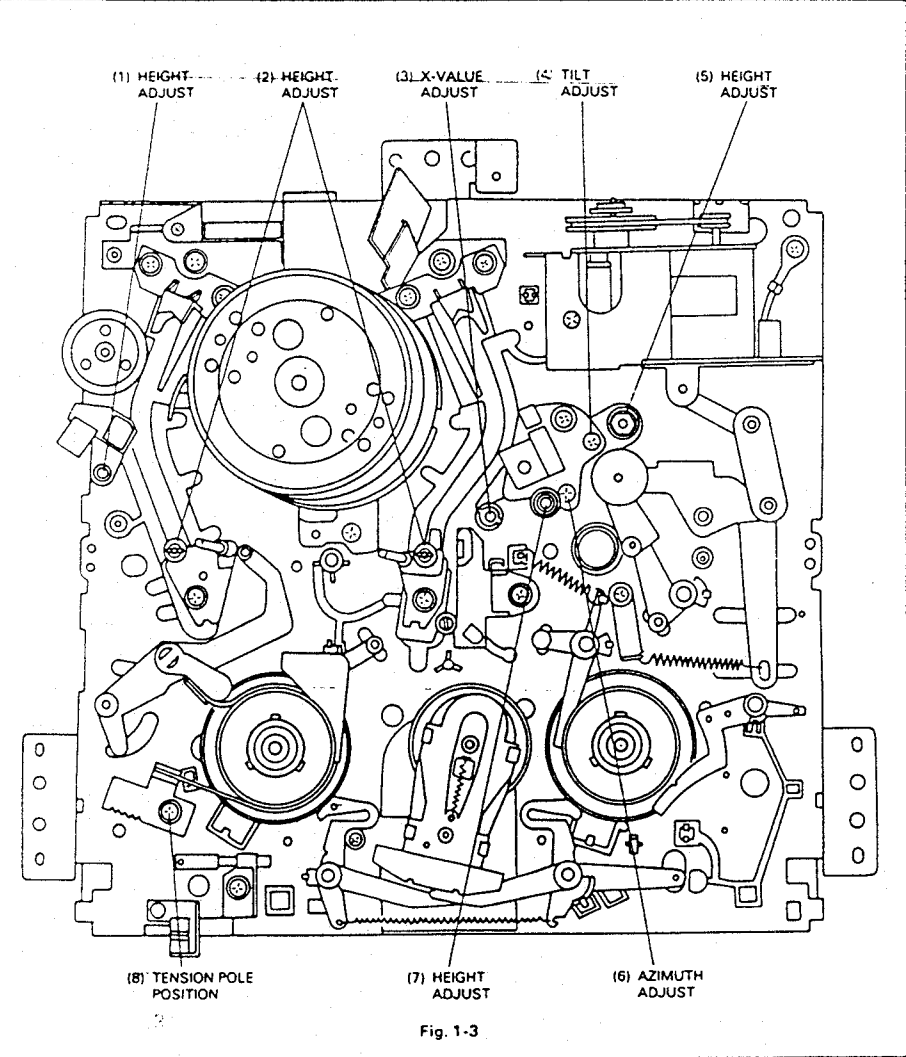
(3) ACE Head X value adjusting nut.

(4) ACE Head tilt adjusting screw.
- (5) ACE Head height adjusting nut.

(6) ACE Head azimuth adjusting screw.

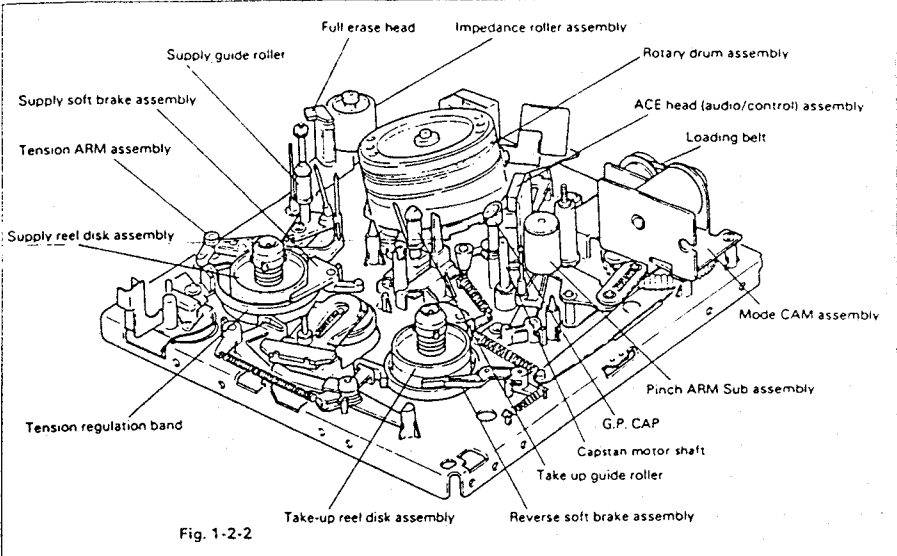
(7) Take-up guide pole height adjusting nut (cap per).

(8) Tension band fixing screw.

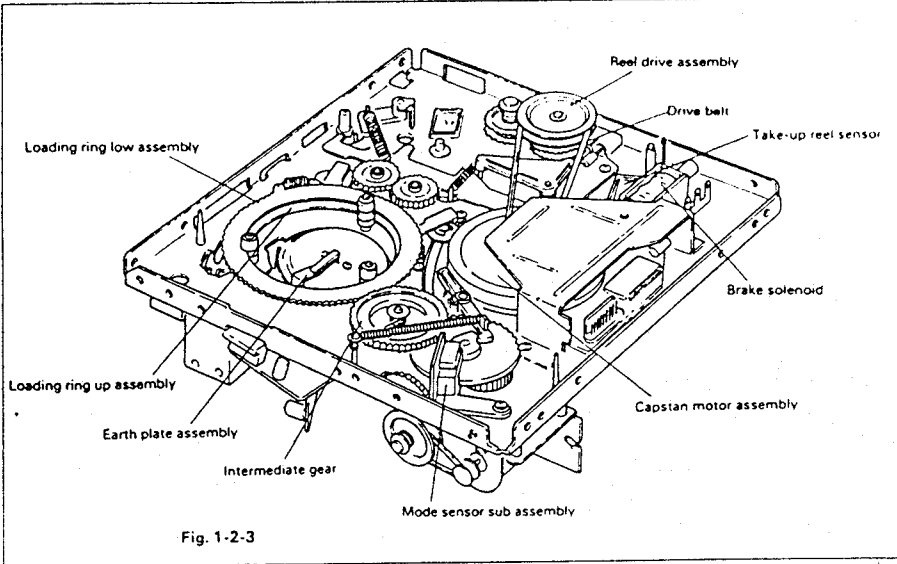


1-2-2 Mechanism parts locations

Top view



Bottom view



1-6. REPLACEMENT OF UPPER ROTATING DRUM ASSEMBLY

- (1) Remove the solder from the four lead wires that connect the video heads to the terminal transformer. (Perform this removal quickly so as not to damage the insulation of the lead wires.)
- (2) Remove the two ① screws, then lift the rotating drum assembly upward and remove it.
- (3) Use alcohol (isopropyl alcohol) to clean the flange surface of the lower drum and the surface on the new rotating drum assembly that will come into contact with the flange. Position the rotating drum assembly so that the wire is aligned with the white marking on the shaded area of the terminal transformer, as shown in Fig. 1-6, then carefully slide it down into place.

Notes:

- 1) Be sure not to touch the head chips, or strike and damage them.
 - 2) If the rotating drum assembly should become hooked on some obstruction before it has been slid completely into place, do not attempt to force it. Remove it and try again.
- (4) Tighten the two ① screws alternately, then solder the four lead wires to their correct positions on the terminal transformer, and make sure that all connections are solid and secure.
 - (5) After the rotating drum assembly has been replaced, be sure to carry out the following checks and adjustments:
 - 1) Control head phase adjustment (refer to Section 3-4)
 - 2) Playback switching point adjustment (refer to Section 1-19)
 - 3) Checking and adjustment of entire video and audio systems (refer to Sections 4-2, 4-3 and 4-5).

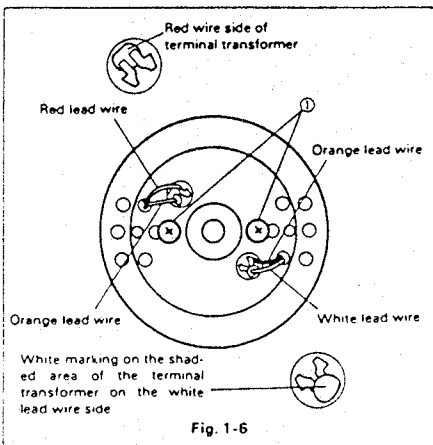


Fig. 1-6

2-6

1-7. REPLACEMENT OF DRUM ASSEMBLY

- (1) Remove the drum assembly connectors ①, ② and ③. (When removing connector ①, hold down the slanting line part of the print substrate.)
- (2) Remove screw ④, shield line.
- (3) Remove the three screws ⑤, and then remove the drum assembly.

Note: Do not touch the drum head tip or damage the drum assembly during this procedure.

- (4) Follow the above instructions in reverse order to install the drum assembly.

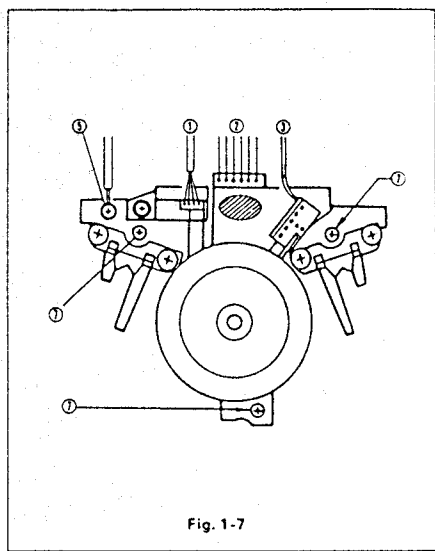


Fig. 1-7

- (5) After replacing, check and adjust as follows:
 - 1) Adjust tape path. (Refer to Section 2.)
 - 2) Adjust for compatibility. (Refer to Section 3.)
 - 3) Make necessary adjustments to the servo system, video system, and audio system. (Refer to Sections 4-2, 4-3 and 4-5.)

1-4. BEFORE ADJUSTING THE MECHANISM

"Adjustment procedures" has been written as a guide to achieve proper operation after replacing the mechanism parts (when required by normal wear and tear or accidental damage). Since the mechanism adjustment procedures are closely related to the adjustment of the electrical circuitry, and form the basis of the electrical circuitry adjustment procedures, carefully follow the mechanism procedures by observing the proper precautions.

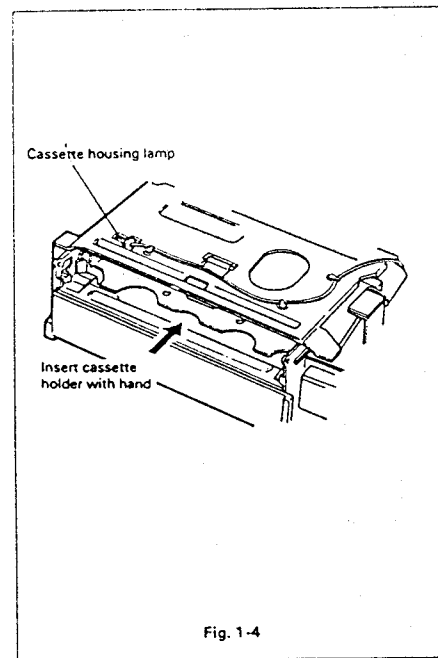


Fig. 1-4

1-5. SERVICING PRECAUTIONS

- (1) Pay special attention to how and where the unit is placed when removing the exterior casing of the unit and when servicing with the circuit boards removed.
- (2) Prevent the loss of screws by putting every removed screw into a container stored at one location.
- (3) Since the surface area of the left and right sides of the unit is small, take special precautions when working with the unit standing on its side so that it will not fall over.

- (3) When operating without using a cassette, insert the cassette holder until it comes to stop as shown in Fig. 1-4, then depress the cassette IN switch (Fig. 1-5). When the cassette house lamp lights, the unit can be operated even with the cassette IN switch released.

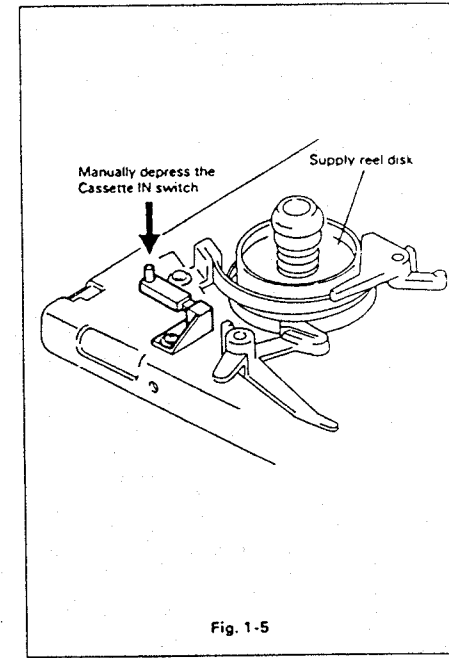


Fig. 1-5

2-5

1-9. AUDIO/CONTROL HEAD

- (1) Remove connectors ④ and ⑤ from the ACE head circuit board. (Remove wires from the wirewrap post ① first.)
- (2) Use a box driver (J-5) to remove the ② nylon nut.
- (3) Rotate the ACE head assembly clockwise, so that it is slightly away from the taper pin, then pull upwards from the head pivot. Be careful during this procedure, because the (TC) spring applies pressure to the assembly.
- (4) Replace the ACE head assembly and mount it into position by following the above procedure in reverse. Set the (TC) spring so that it comes into contact with the outer side of the bent out ④ part of the ACE Sub assembly. (Fig. 1-9)
- (5) After the ACE head assembly has been replaced, adjust the height of the new ACE head assembly.
- (6) To adjust the height of the ACE Head, first place the Master Plane B Jig (J-13) on the chassis reference pin. Place the Height Gauge B Jig (J-15) on J-13 with the surface marked with an "H" facing up, and use the nylon nut box driver ② to adjust to the same height as part A. Also, adjust the height of the tapered pin by following the same procedure as for the ACE Head. Use adjustment driver J-4 to adjust to the same height as part B.

6 Handling of Service Drum Package

Remove the drum from the inner box as shown in the figure below. Remove the three black screws from inside of the box, remove the board, and then remove the drum assembly.

Note:

The drum assembly is precisely adjusted. Handle carefully to prevent it from becoming dirty, scratched, damaged or deformed in any way.

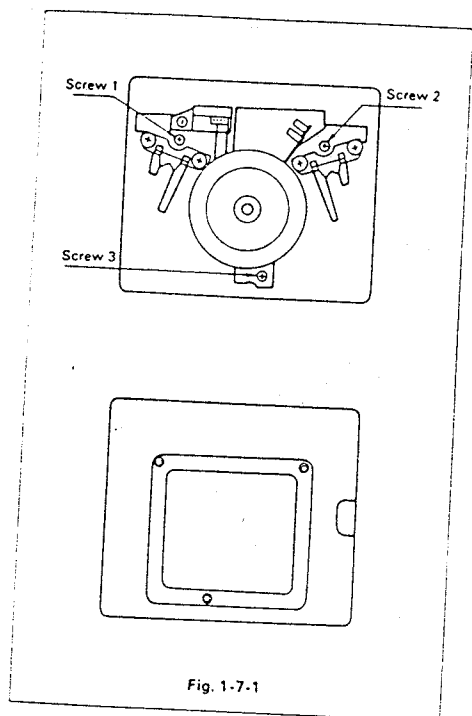


Fig. 1-7-1

1-8. REPLACEMENT OF GROUND PLATE

- 1 After first placing the unit on its side, open the bottom of the unit and remove the ① screw, as shown in Fig. 1-8.
- 2 Use the ① screw to attach the grounding plate so that its contact area is aligned with the center of the drum assembly shaft.

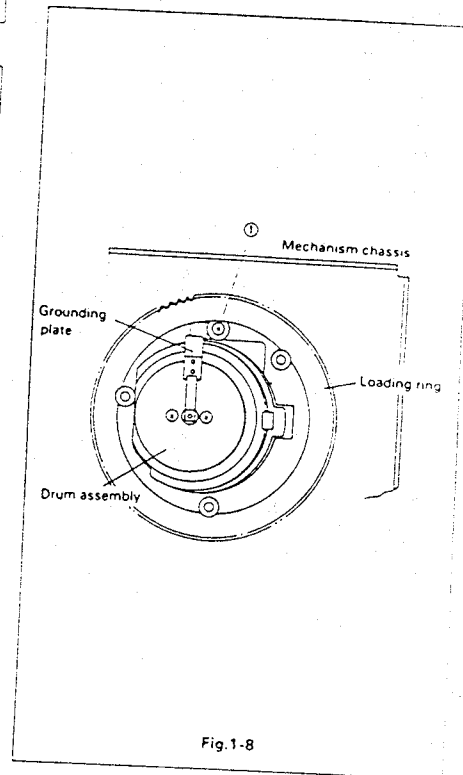


Fig. 1-8

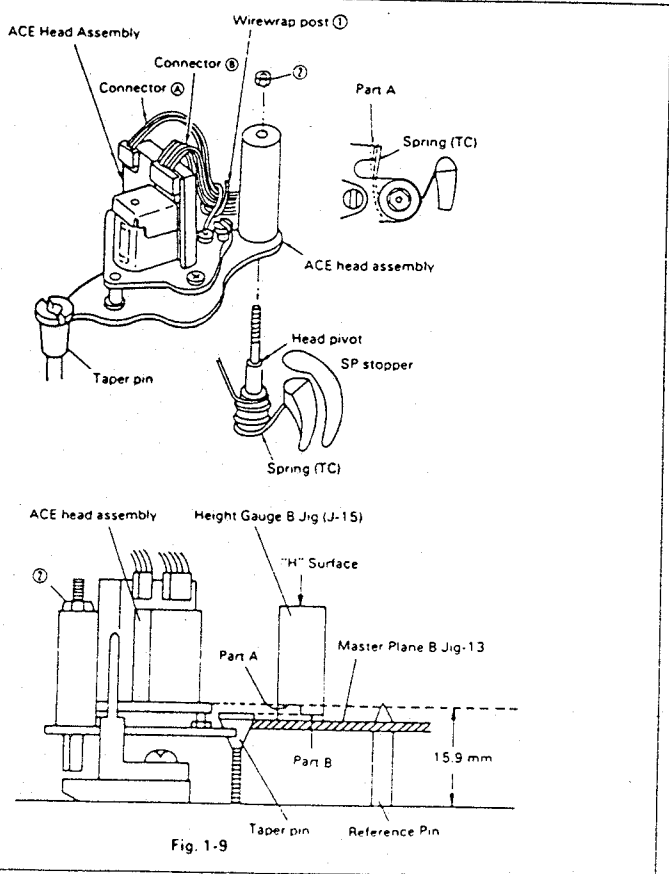
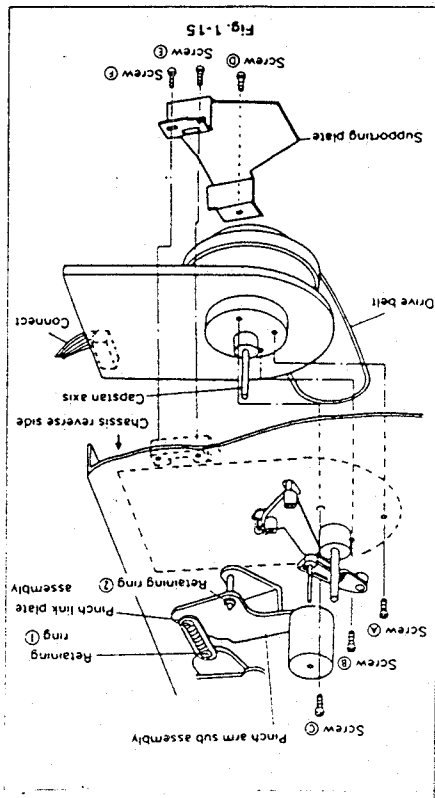
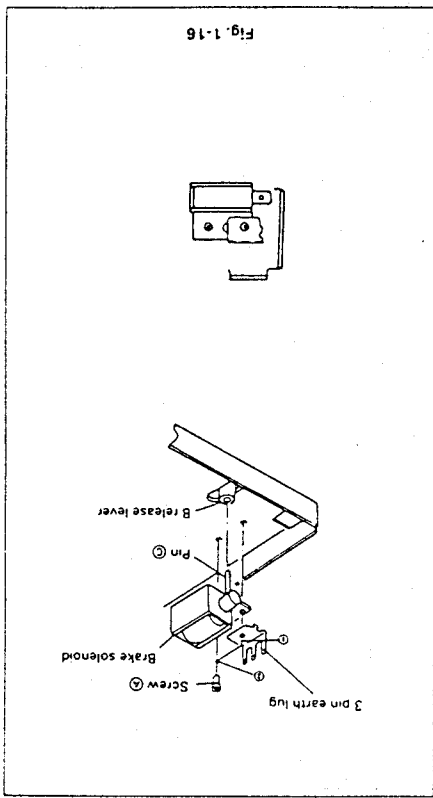


Fig. 1-9



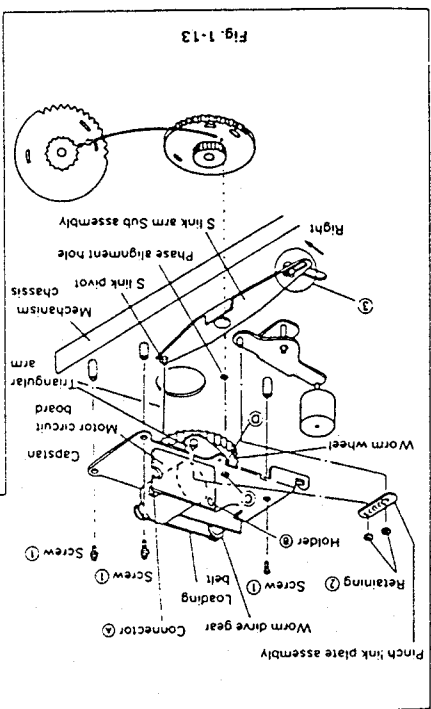
- (1) Remove the ① and ② retaining rings, then remove the punch arm sub assembly upwards.
- (2) Working from the reverse side of the chassis, remove the ③ and ④ screws, then remove the supporting plate.
- (3) Remove the drive belt, then remove the connector ⑤ and ⑥ screws. Remove the ⑦.
- (4) Remove the capstan motor and mount it into position ⑧ and ⑨ screws.
- (5) Replace the capstan motor and mount it into position by following the above procedure in reverse. During this operation, care should be taken not to damage or magnetize the capstan axis.

1-15. CAPSTAN MOTOR



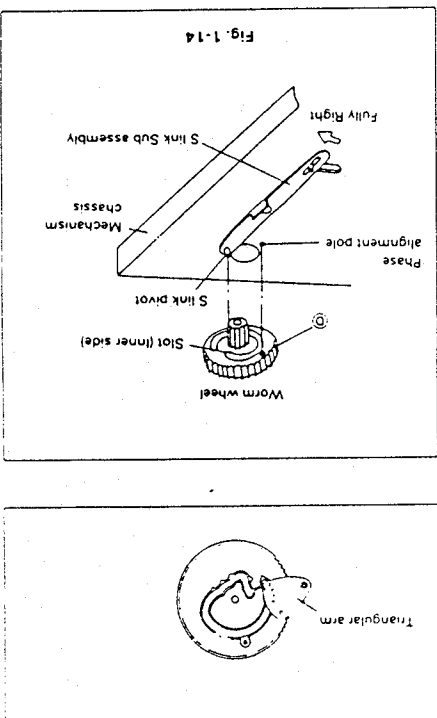
- (1) Work from the reverse side of the chassis, and remove the ② screw. Then remove the brake solenoid assembly and 3 pin earth lug upwards, as shown in Fig. 1-16.
 - (2) Replace the brake solenoid assembly and mount it into position following the above procedure in reverse.
- Notes:
1. Insert the ③ pin firmly into the hole of the B release lever.
 2. Be sure to tighten down the screws so that the brake solenoid assembly is positioned as shown in Fig. 1-16.

1-16. BRAKE SOLENOIDS

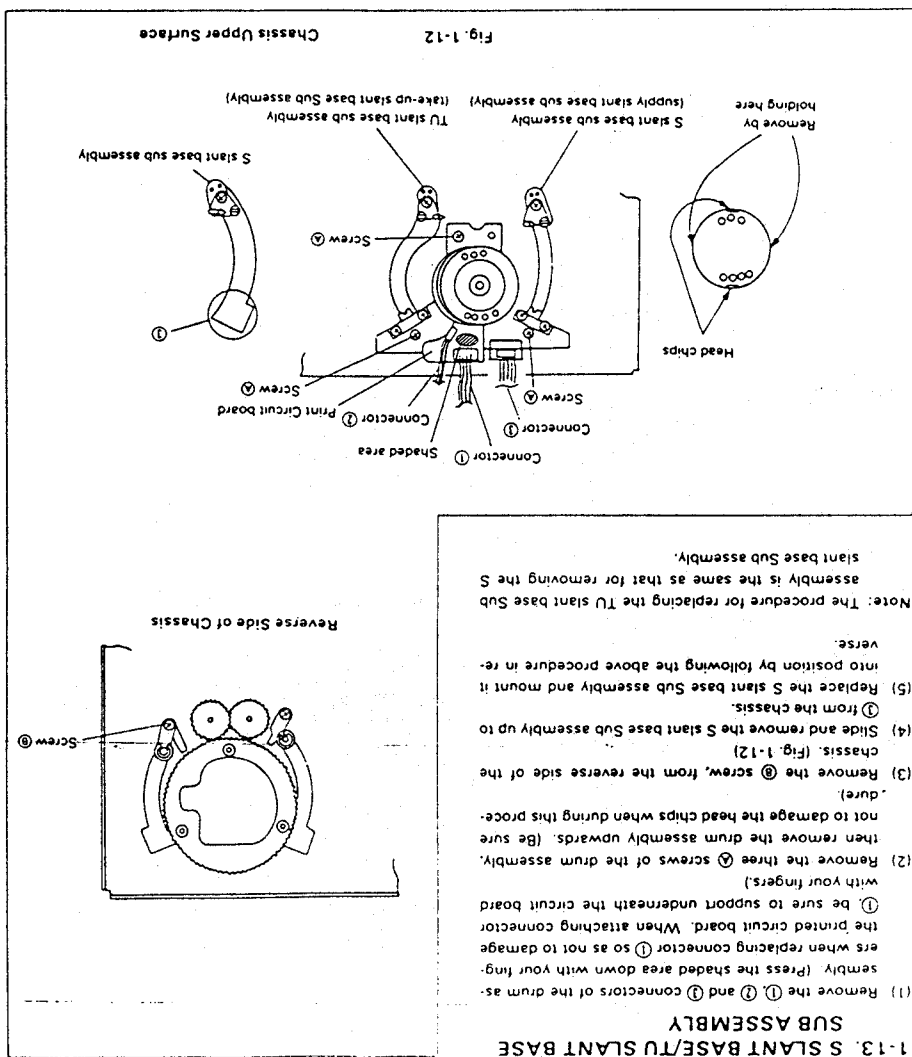


- (1) Remove the loading belt of the entire mode cam assembly. Rotate the worm drive gear by hand so that the ① part of the S link arm assembly comes as far to the right as possible as shown in Fig. 1-13. (This position is the same as for the FF or the REV mode.)
- (2) Remove the connector ② of the motor circuit board. Next, remove the wires for the ACE head from the board holder behind the circuit board (pattern side). (When During this procedure, be sure to remove the connector of the ACE head first.)
- (3) Remove the ② retaining rings, then remove the pinch link plate assembly.
- (4) Remove the three ① screws, then remove the entire mode cam assembly upwards.

1-14. ENTIRE MODE CAM ASSEMBLY

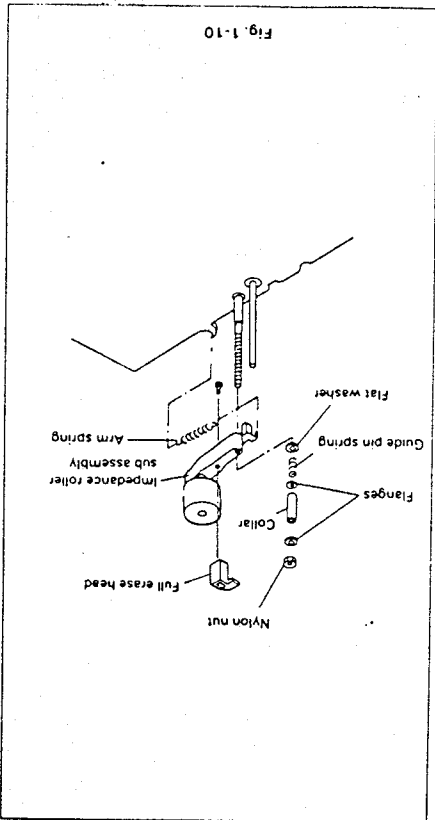


1. When attaching the mode cam sub assembly be sure that the motor base ③ hole of the entire mode cam assembly and worm wheel ④ hole are aligned with the phase alignment hole of the mechanism chassis. Also be sure that the hole of the mode gear on the reverse side of the chassis is aligned with the phase alignment hole of the mechanism chassis.
 2. As shown in Fig. 1-14, place the S link pivot into the slot on the inner side of the mode cam.
- Notes:
- (5) Replace the entire mode cam assembly and mount it into position by following the above procedure in reverse.



1-13. S SLANT BASE/TU SLANT BASE SUB ASSEMBLY

- (1) Remove the ① and ② connectors of the drum assembly. Press the shaded area down with your fingers. Be sure to support underneath the circuit board the printed circuit board. When attaching connector ① so as not to damage the drum assembly upwards. (Be sure not to damage the head chips when during this procedure.)
 - (2) Remove the three ③ screws of the drum assembly, then remove the drum assembly upwards.
 - (3) Remove the ④ screw, from the reverse side of the chassis. (Fig. 1-12)
 - (4) Slide and remove the S slant base sub assembly up to the chassis.
 - (5) Replace the S slant base sub assembly and mount it into position by following the above procedure in reverse.
- Note: The procedure for replacing the TU slant base sub assembly is the same as that for removing the S slant base sub assembly.

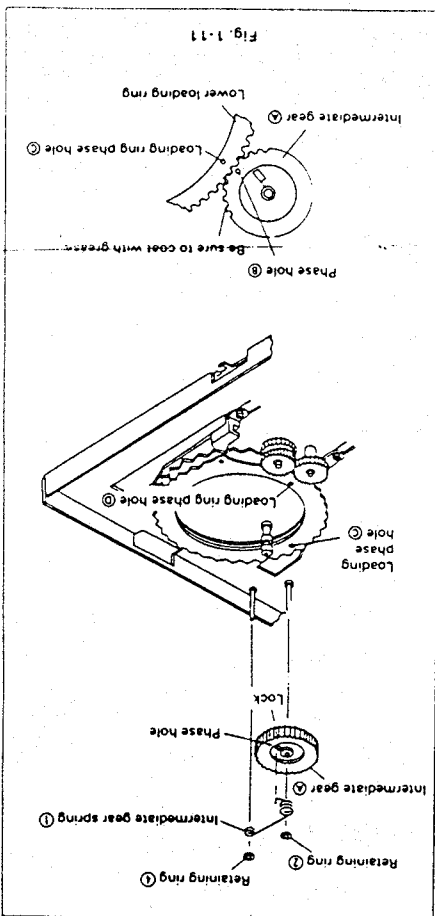


- (1) Remove the nylon nut, the upper flange collar, lower flange, collar, lower flange, guide pin spring, flat washer and arm spring.
- (2) First remove the nylon nut then remove the upper flange, collar, lower flange, guide pin spring, flat washer and arm spring.
- (3) Remove the impedance roller sub assembly upwards.
- (4) Remove the screw that secures the full erase head from underneath the impedance roller arm. Then remove the full erase head itself.
- (5) Replace the full erase head and mount it into position, following the above procedure in reverse.

1-10. FULL ERASE HEAD

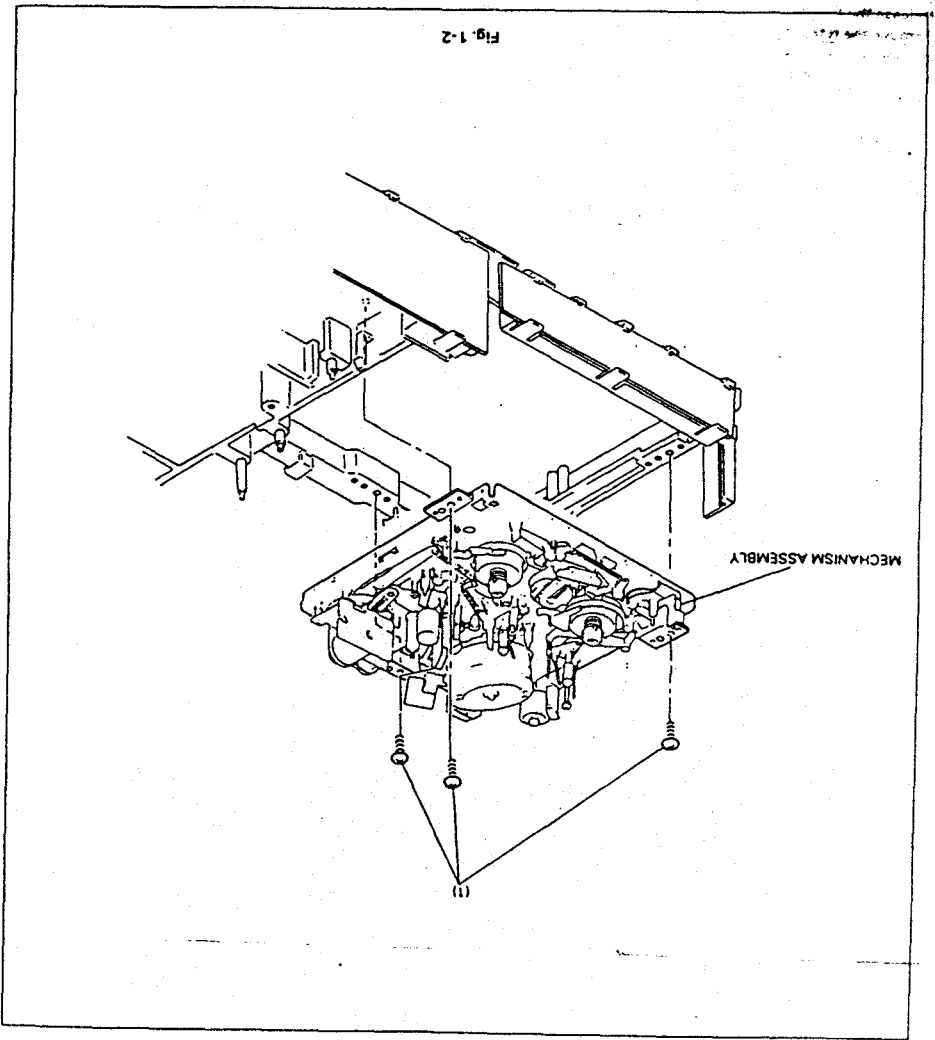
1-11. IMPEDANCE ROLLER SUB ASSEMBLY

- (1) Remove the nylon nut, the upper flange collar, lower flange, collar, lower flange, guide pin spring, flat washer and arm spring.
- (2) First remove the nylon nut then remove the upper flange, collar, lower flange, guide pin spring, flat washer and arm spring.
- (3) Remove the impedance roller sub assembly upwards.
- (4) Remove the screw that secures the full erase head from underneath the impedance roller arm. Then remove the full erase head itself.
- (5) Replace the full erase head and mount it into position, following the above procedure in reverse.



- (1) As shown in Fig. 1-11, when the ③ loading phase holes of the upper and lower loading rings are aligned, attach the ④ intermediate gear so that the ⑤ phase hole of the intermediate gear and the ⑥ phase hole of the loading ring are facing each other, as shown in Fig. 1-11.
2. Be sure that the ① intermediate gear spring is firmly secured to the lock of the intermediate gear.
- (3) Replace the ② intermediate gear and mount it into position by following the above procedure in reverse.
- (2) Remove the intermediate gear upwards.
- (1) As shown in Fig. 1-11, remove the retaining rings ③ and ④. Then remove the ① intermediate gear spring.

1-12. INTERMEDIATE GEAR



- 1-2-1. MECHANISM ASSEMBLY
- (1) Remove the top cover and front panel. (Refer to items 1-1 and 1-3)
 - (2) Perform steps (2) and (3) of the S/S/A/V circuit board removal procedure. (Refer to item 3-3)
 - (3) Remove the shield cover and cassette housing assembly. (Refer to item 4-1)
 - (4) Disconnect three wire connectors and two lead wires (grey) of the rotary drum assembly from the circuit board. Remove the screw of the lead wire with earth lug. Disconnect eleven wire connectors of the other mechanical assembly parts from the circuit board.
 - (5) Remove three screws (1).

Note: The items identified by * mark in the list are not stocked in warehouse.

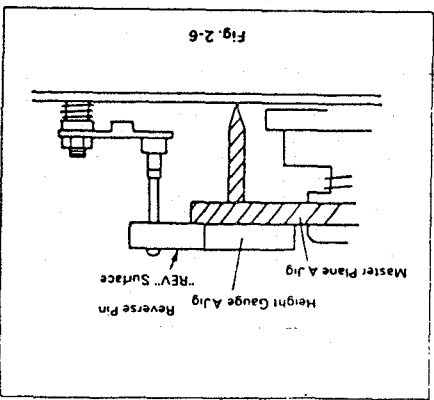
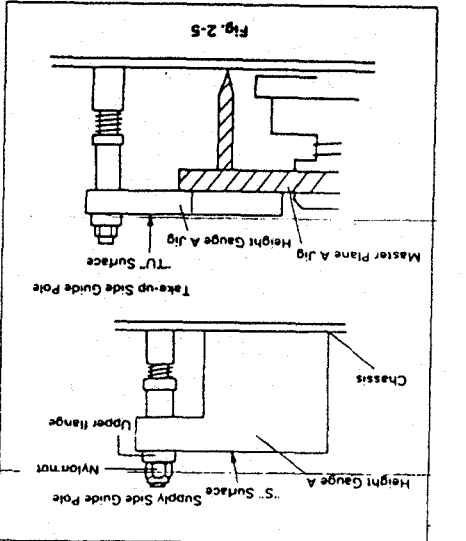
Fig. 1-1

J-13 Master Plane A Jig 16951361	J-14 Master Plane B Jig 16951361	J-15 Height Gauge B Jig 16951361	J-16 Cassette tape (E-120) For checking tape path 16951372
J-9 Cleaning cassette tape For cleaning video heads Torque meter (79V20200) 500g/cm Torque gauge head (79V21508) 150g/cm Torque meter (79V20199) 150g/cm 16951311	J-10 Cleaning cassette tape For cleaning video heads Torque meter (79V20200) 500g/cm Torque gauge head (79V21508) 150g/cm Torque meter (79V20199) 150g/cm 16951311	J-11 Back Tension cassette Gauge 79V20202 16950001	J-12 Height Gauge A Jig 16951372
J-5 Box driver For ACE head, guide pole and reverse pin 16950871	J-6 Alignment tape (MH-2) Overall adjusting of picture quality and tracking MH-2 79V20196 16951281	J-7 Cleaning liquid (isopropyl alcohol) Cleaning cloth for cleaning heads 16951291	J-8 Head demagnetizer 16951301
J-1 Checking mirror For tape flow check and adjustment procedures 16950871	J-2 Hexagonal driver For guide roller screw 16951281	J-3 Adjustment driver For guide roller 16951291	J-4 Adjustment driver For tapered pin of ACE head 16951301

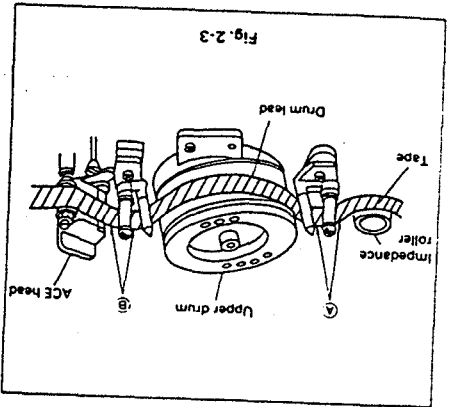
1. MECHANICAL ADJUSTMENT (N9034G)

1-1. SERVICING JIGS AND TOOLS

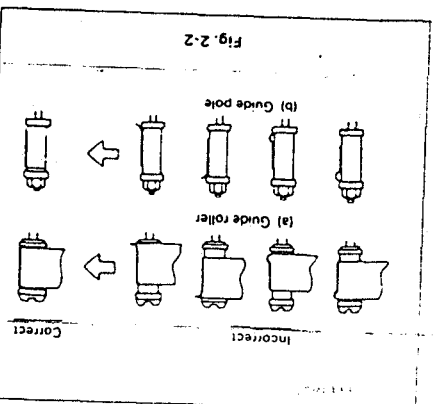
- 1-2-1. MECHANISM ASSEMBLY
- (1) Remove the top cover and front panel. (Refer to items 1-1 and 1-3)
 - (2) Perform steps (2) and (3) of the S/S/A/V circuit board removal procedure. (Refer to item 3-3)
 - (3) Remove the shield cover and cassette housing assembly. (Refer to item 4-1)
 - (4) Disconnect three wire connectors and two lead wires (grey) of the rotary drum assembly from the circuit board. Remove the screw of the lead wire with earth lug. Disconnect eleven wire connectors of the other mechanical assembly parts from the circuit board.
 - (5) Remove three screws (1).



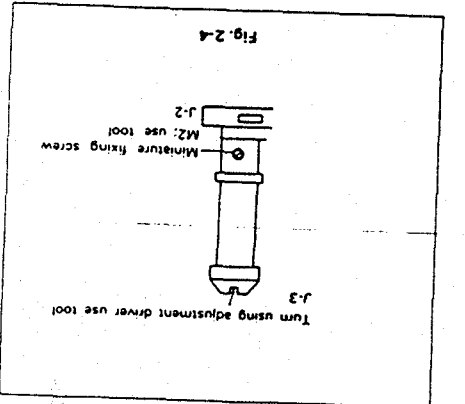
2-3. ADJUSTING THE TAPE TRANSPORT SYSTEM



- Note: Be sure to carry out intercompatibility adjustments after the tape transport system has been adjusted, to ensure compatibility among parts.
- (1) To adjust the height of supply-side guide pole, set the Height Gauge A Jig (J-12) on the chassis as shown in Fig. 2-5, and use the nylon nut to adjust to the height of the lower surface of the upper flange.
 - (2) To adjust the height of take-up-side guide pole, place the Master Plane A Jig (J-14) on the chassis, and place the Height Gauge A Jig (J-12) on J-14 with the side marked "TV" facing up as shown in Fig. 2-5. Then use the nylon nut to adjust to the height of the lower surface of the upper flange.



- Note: When adjusting the tape-up guide pole height, be sure to remove the cap.
- (1) To adjust the height of supply-side guide pole, set the Height Gauge A Jig (J-12) on the chassis as shown in Fig. 2-5, and use the nylon nut to adjust to the height of the lower surface of the upper flange.
 - (2) To adjust the height of take-up-side guide pole, place the Master Plane A Jig (J-14) on the chassis, and place the Height Gauge A Jig (J-12) on J-14 with the side marked "TV" facing up as shown in Fig. 2-5. Then use the nylon nut to adjust to the height of the lower surface of the upper flange.



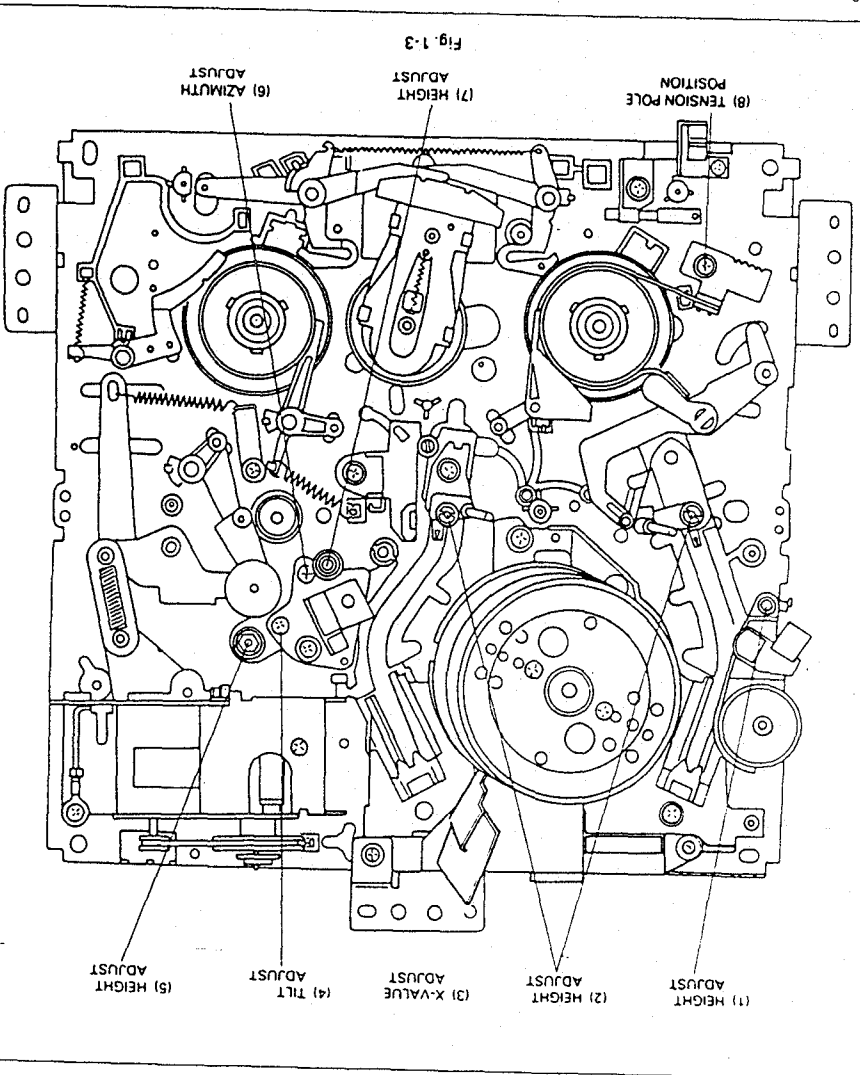
- 2-3-1. Adjusting the guide roller height (vertical pole height adjustment)
- (1) As shown in Fig. 2-4, loosen the fixing screws of the supply guide roller and take-up guide roller. (Until the guide rollers can be turned easily by using the adjustment screwdriver.)

1-3. BEFORE DISASSEMBLING PARTS ON THE CHASSIS

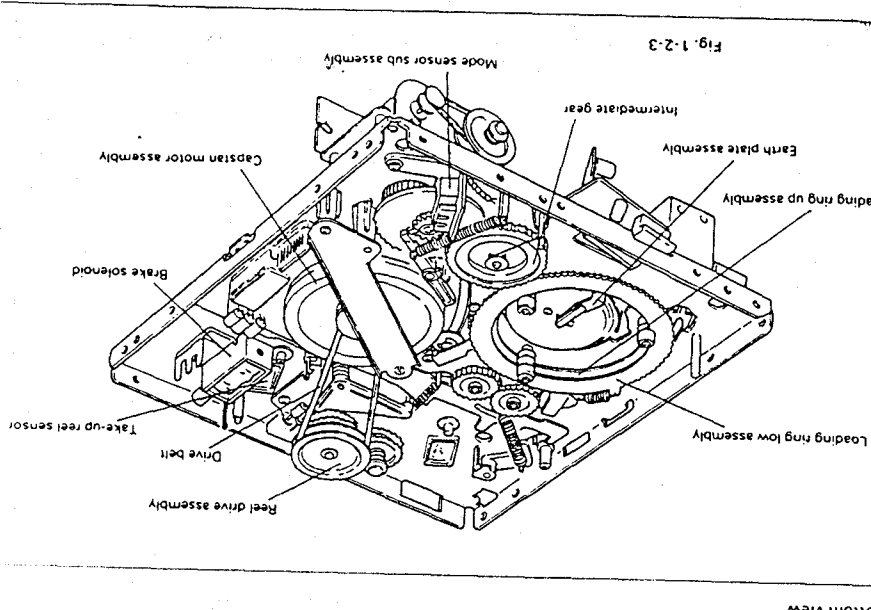
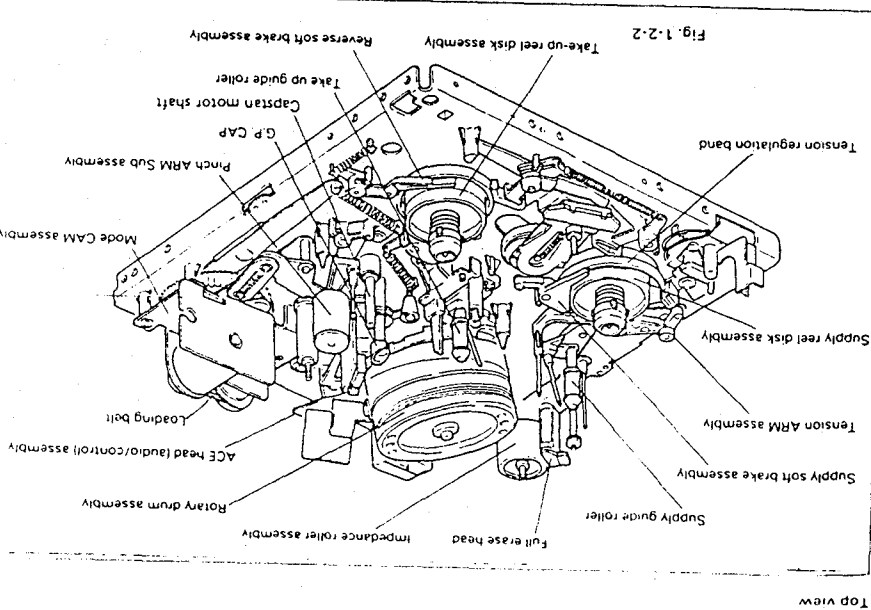
- (1) Supply guide pole height adjusting screw
- (2) Take-up/supply guide roller height adjusting screw
- (3) ACE Head X value adjusting nut
- (4) ACE Head tilt adjusting screw

Do not turn the adjusting screws shown below when re-moving adjacent parts.

- (5) ACE Head height adjusting nut
- (6) ACE Head azimuth adjusting screw
- (7) Take-up guide pole height adjusting nut (cap per)
- (8) Tension band fixing screw.



1-2-2 Mechanism parts locations



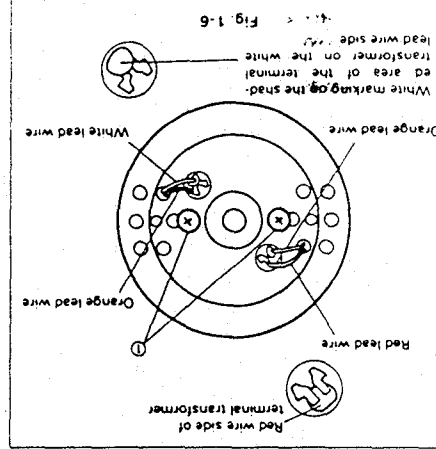
1-6. REPLACEMENT OF UPPER ROTATING DRUM ASSEMBLY

- (1) Remove the solder from the four lead wires that connect the video heads to the terminal transformer. (Perform this removal quickly so as not to damage the insulation of the lead wires.)
- (2) Remove the two (2) screws, then lift the rotating drum assembly upward and remove it.
- (3) Use alcohol (isopropyl alcohol) to clean the flange surface of the lower drum and the surface on the new rotating drum assembly that will come into contact with the flange. Position the rotating drum assembly so that the wire is aligned with the white marking on the shaded area of the terminal transformer, as shown in Fig. 1-6, then carefully slide it down into place.

Notes:

- (1) Be sure not to touch the head chips, or strike and damage them.
- (2) If the rotating drum assembly should become hooked on some obstruction before it has been slid completely into place, do not attempt to force it. Remove it and try again.

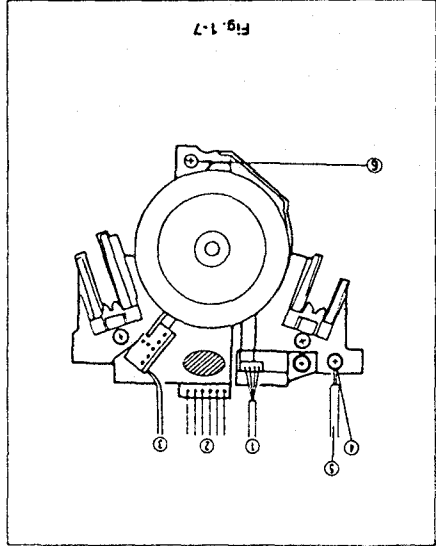
- (4) Tighten the two (2) screws alternately, then solder the four lead wires to their correct positions on the terminal transformer, and make sure that all connections are solid and secure.
- (5) After the rotating drum assembly has been replaced, be sure to carry out the following checks and adjustments:
- (1) Control head phase adjustment (refer to Section 3-4)
- (2) Playback switching point adjustment (refer to Section 1-1-9)
- (3) Checking and adjustment of entire video and audio systems (refer to Sections 4-2, 4-3 and 4-5).



1-7. REPLACEMENT OF DRUM ASSEMBLY

- (1) Remove the drum assembly connectors (1), (2) and (3) (When removing connector (3) hold down the slanting line part of the print substrate.)
- (2) Remove the screw (2) and shield line (3)
- (3) Remove the three screws (4), and then remove the drum assembly.
- (4) Follow the above instructions in reverse order to install the drum assembly.

Note: Do not touch the drum head tips or damage the drum assembly during this procedure.



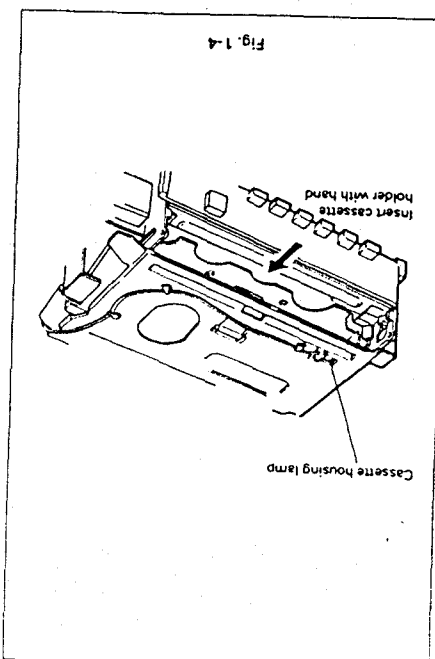
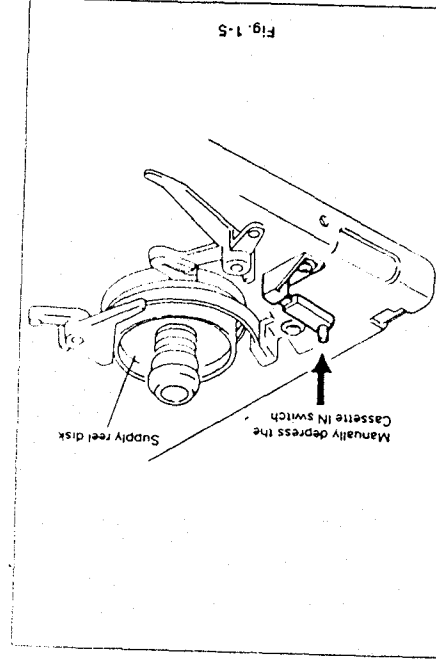
- (5) After replacing, check and adjust as follows:
- (1) Adjust tape path. (Refer to Section 2)
- (2) Adjust for compatibility. (Refer to Section 3)
- (3) Make necessary adjustments to the servo system, video system, and audio system. (Refer to Sections 4-2, 4-3 and 4-5)

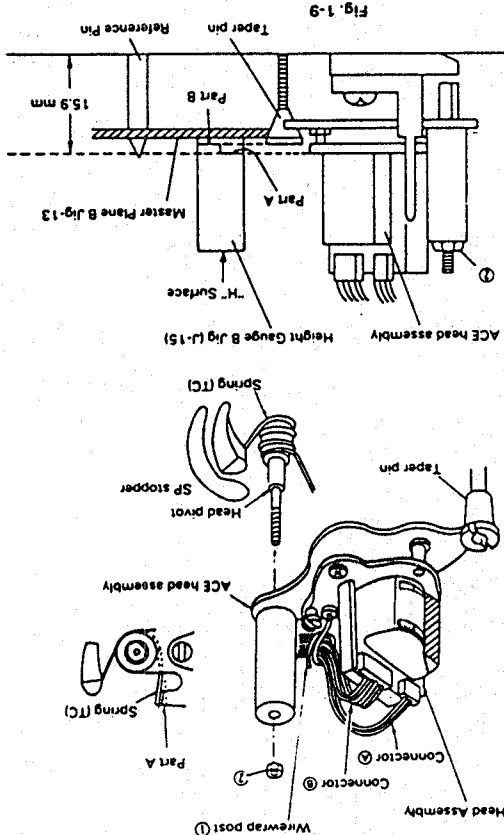
1-4. BEFORE ADJUSTING THE MECHANISM

- (1) Pay special attention to how and where the unit is placed when removing the exterior casing of the unit, and when servicing with the circuit boards removed.
- (2) Prevent the loss of screws by putting every removed screw into a container stored at one location.
- (3) Since the surface area of the left and right sides of the unit is small, take special precautions when working with the unit standing on its side so that it will not fall over.

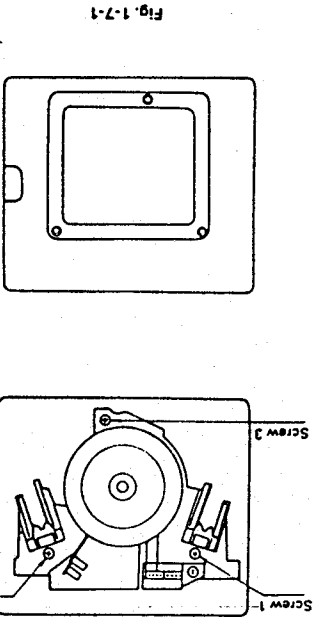
"Adjustment procedures" have been written as a guide to achieve proper operation after replacing mechanism parts (when required by normal wear and tear or accidental damage). Since the mechanism adjustment procedures are closely related to the adjustment of the electrical circuitry, and form the basis of the electrical adjustment procedures by ob-serving the proper precautions.

- (3) When operating without using a cassette, insert the cassette holder until it comes to stop as shown in Fig. 1-4, then depress the cassette IN switch (Fig. 1-5). When the cassette house lamp lights, the unit can be operated even with the cassette IN switch released.

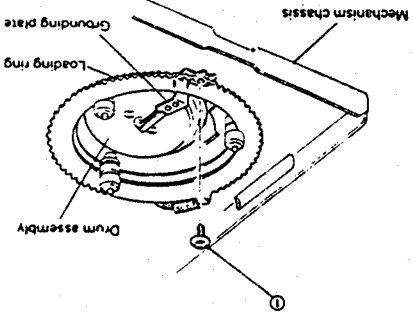




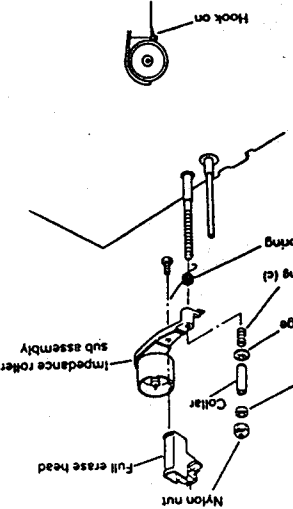
- (1) Remove connectors ④ and ⑤ from the ACE head circuit board.
- (2) Use a **hook** (J-5) to remove the ① nylon nut.
- (3) Rotate the ACE head assembly clockwise, so that it is slightly away from the taper pin, then pull upwards from the head pivot. Be careful during this procedure, because the TFC spring applies pressure to the assembly.
- (4) Replace the ACE head assembly and mount it into position by following the above procedure in reverse. Set the TFC spring so that it comes into contact with the outer side of the bent out ④ part of the ACE Sub assembly. (Fig. 1-9)



6. Handling of Service Drum Package
Remove the drum from the inner box as shown in the figure below. Remove the three black screws from inside of the box, remove the board, and then remove the drum assembly.



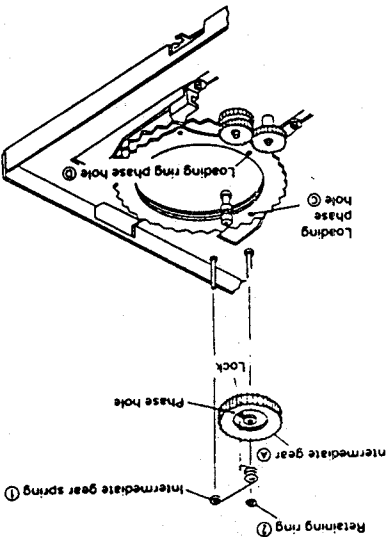
1. After first placing the unit on its side, open the bottom of the unit and remove the ① screw.
2. Use the ① screw to attach the grounding plate so that its contact area is aligned with the center of the drum assembly shaft.



- (1) Remove the connector from the full erase head.
- (2) First remove the nylon nut then remove the upper flange, collar, taper flange, IP spring (c) and arm spring.
- (3) Remove the impedance roller Sub assembly upwards.
- (4) Remove the screw that secures the full erase head from underneath the impedance roller arm. Then remove the full erase head itself.
- (5) Replace the full erase head and mount it into position following the above procedure in reverse.

1-11. IMPEDANCE ROLLER SUB ASSEMBLY

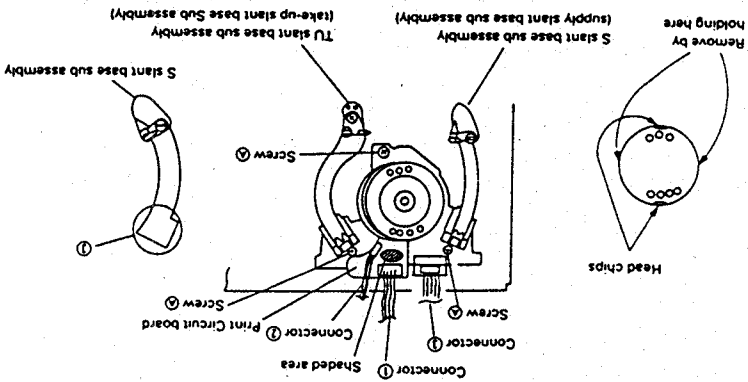
- (1) Remove the nylon nut, the upper flange collar, taper flange, IP spring (c) and arm spring.
- (2) Remove the impedance roller Sub assembly upwards.
- (3) Replace the impedance roller Sub assembly and mount it into position by following the above procedure in reverse.



- (1) Remove the retaining rings (A). (1) Remove the intermediate gear spring.
- (2) Remove the intermediate gear upwards.
- (3) Replace the (A) intermediate gear and mount it into position by following the above procedure in reverse.

Notes:

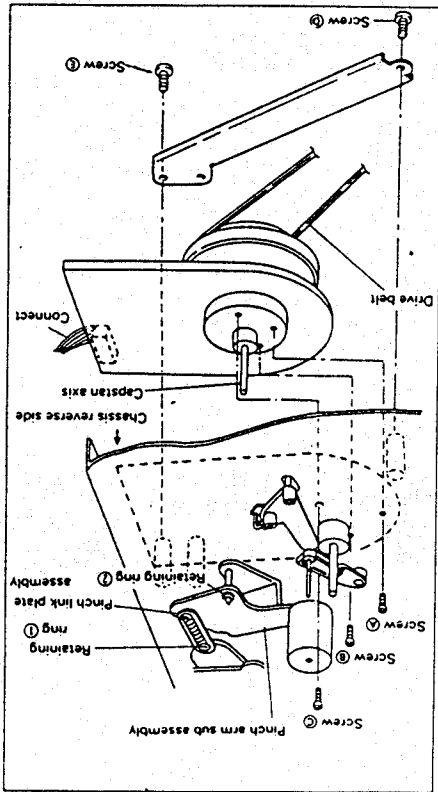
1. As shown in Fig. 1-11, when the (B) loading phase holes of the upper and lower loading rings are aligned, attach the (A) intermediate gear so that the (C) phase hole of the (A) intermediate gear and the (C) phase hole of the loading ring are facing each other, as shown in Fig. 1-11.
2. Be sure that the (1) intermediate gear spring is firmly secured to the lock of the intermediate gear.



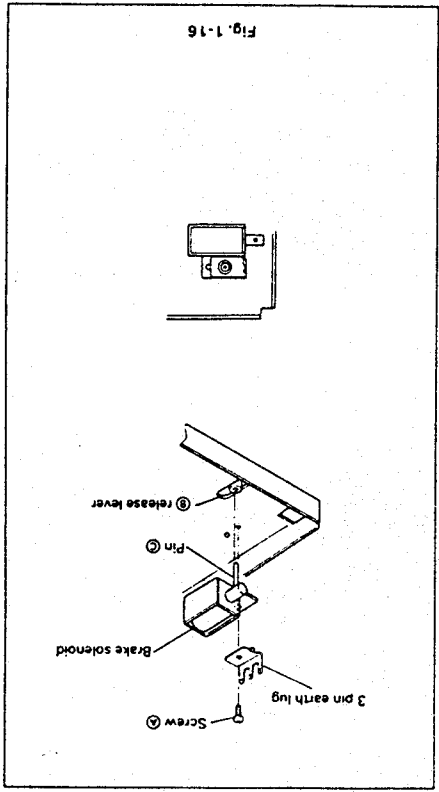
Note: The procedure for replacing the TV slant base Sub assembly is the same as that for removing the S slant base Sub assembly.

Reverse.

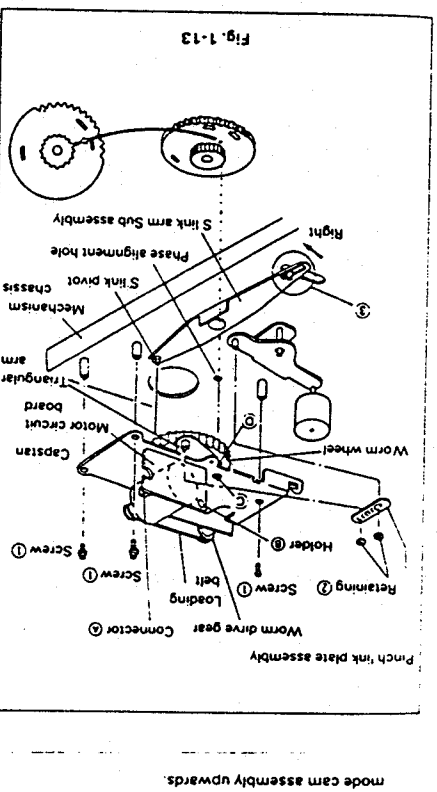
- (1) Remove the ① and ② connectors of the drum assembly. (Press the shaded area down with your fingers when replacing connector ①) so as not to damage the printed circuit board. When attaching connector ①, be sure to support underneath the circuit board with your fingers.)
- (2) Remove the three ③ screws of the drum assembly. Then remove the drum assembly upwards. (Be sure not to damage the head tips during this procedure).
- (3) Remove the ④ screw, from the reverse side of the chassis.
- (4) Slide and remove the S slant base Sub assembly up to the chassis.
- (5) Replace the S slant base Sub assembly and mount it into position by following the above procedure in reverse.



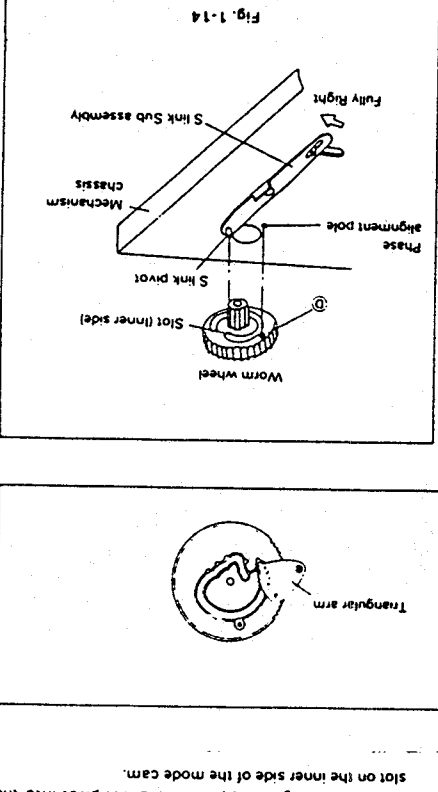
- 1-15. CAPSTAN MOTOR
- (1) Remove the ① and ② retaining rings, then remove the pinch arm sub assembly upwards.
 - (2) Working from the reverse side of the chassis, remove the ③, ④, ⑤ screws, then remove the supporting plate.
 - (3) Remove the drive belt, then remove the connector from the capstan motor circuit board. Remove the ⑥, ⑦ and ⑧ screws.
 - (4) Remove the capstan motor.
 - (5) Replace the capstan motor and mount it into position by following the above procedure in reverse. During this operation, care should be taken not to damage or magnetize the capstan axis.



- 1-16. BRAKE SOLENOIDS
- (1) Work from the reverse side of the chassis, and remove the ① screw. Then remove the brake solenoid assembly and 3 pin earth lug upwards, as shown in Fig. 1-16.
 - (2) Replace the brake solenoid assembly and mount it into position following the above procedure in reverse.
- Notes:
1. Insert the ② pin firmly into the hole of the B release lever.
 2. Be sure to tighten down the screws so that the brake solenoid assembly is positioned as shown in Fig. 1-16.

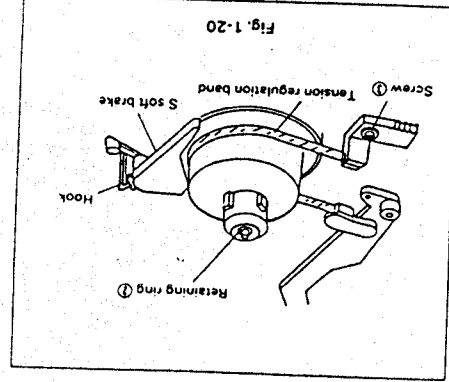


- 1-14. ENTIRE MODE CAM ASSEMBLY
- (1) Remove the loading belt of the entire mode cam assembly, rotate the worm drive gear by hand so that the right as possible as shown in Fig. 1-13. (This position is the same as for the FF or the HEW mode.)
 - (2) Next, remove the connector ② of the motor circuit board behind the circuit board (batter side). When during this procedure, be sure to remove the connector of the ACE head first.)
 - (3) Remove the ① retaining rings, then remove the pinch link plate assembly.
 - (4) Remove the three ③ screws, then remove the entire mode cam assembly upwards.

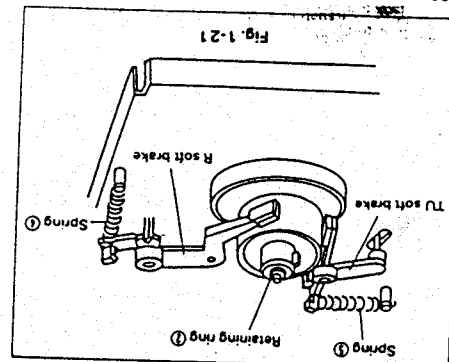


- Notes:
1. When attaching the mode cam Sub assembly be sure that the motor base ③ hole of the entire mode cam assembly and worm wheel ④ hole are aligned with the phase alignment hole of the mechanism chassis. Also be sure that the hole of the mode gear on the reverse side of the chassis is aligned with the phase alignment hole of the mechanism chassis.
 2. As shown in Fig. 1-14, place the S link pivot into the slot on the inner side of the mode cam.
- (5) Replace the entire mode cam assembly and mount it into position by following the above procedure in reverse.

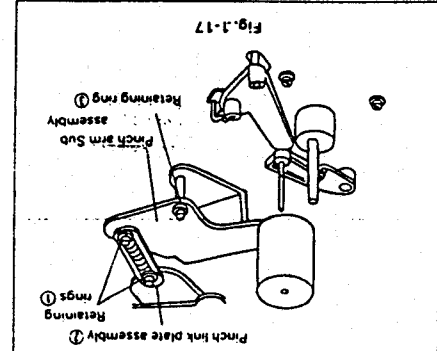
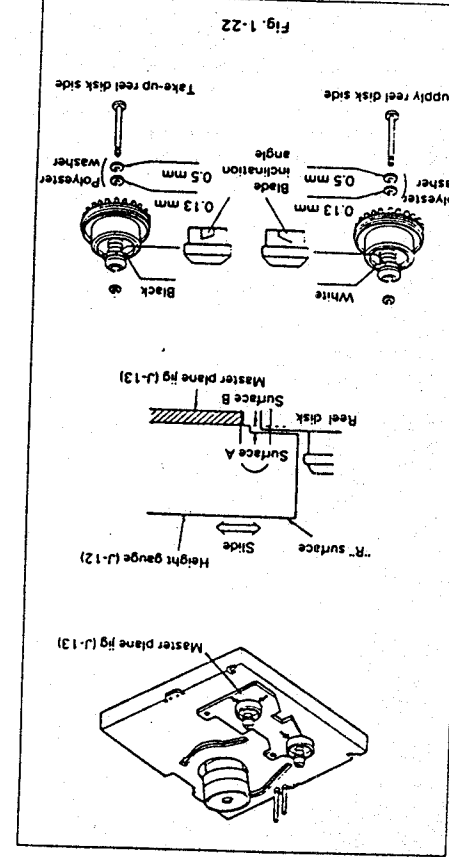
- 1-20. SUPPLY REEL DISK
- (1) Release the S soft brake upwards from the hook.
 - (2) Remove the retaining ring from the reverse side of the tension regulation arm, then remove the ③ screw and supply reel disk upwards.
 - (3) Remove the ⑦ retaining ring, and then remove the supply reel disk upwards.
 - (4) Replace the supply reel disk and mount it into position by following the above procedure in reverse.



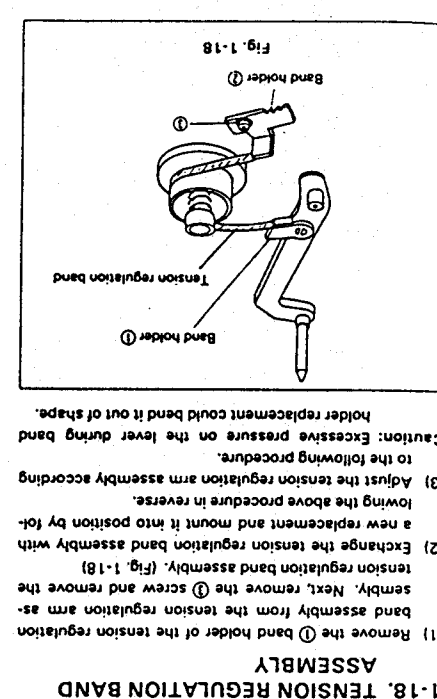
- 1-21. TAKE-UP REEL DISK
- (1) Remove the ③ spring, then remove the R soft brake upwards.
 - (2) Remove the ④ spring, then remove the take-up reel disk upwards.
 - (3) Remove the ⑦ retaining ring, then remove the take-up reel disk upwards.
 - (4) Replace the reel disk and mount it into position, by following the above procedure in reverse.
- Note:
- During this procedure, gently force the hook outwards with your finger so that the soft brake can be removed.



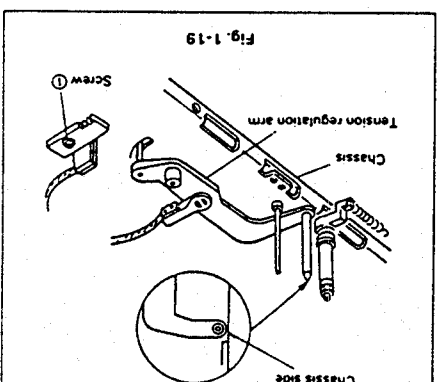
- 1-22. ADJUSTMENTS WHEN REPLACING REELS
- Height adjustment of reel disk (height confirmation of supply and take-up reel disks)
- Set the master plane B Jig (J-1-3) on the disk.
- Next place the Height Gauge B Jig (J-1-5) in the positions marked with "R" facing up. Slide as shown in Fig. 1-22, and verify that the A Surface of the Height Gauge B Jig (J-1-5) slides over the upper surface of the reel table and that the B Surface does not.
- If reel disk is outside this range, use polyester washers to make the required adjustments (Fig. 1-22).
- Part numbers of polyester washers for adjustment
- 1628731 thickness 0.5 mm
- 1628801 thickness 0.13 mm



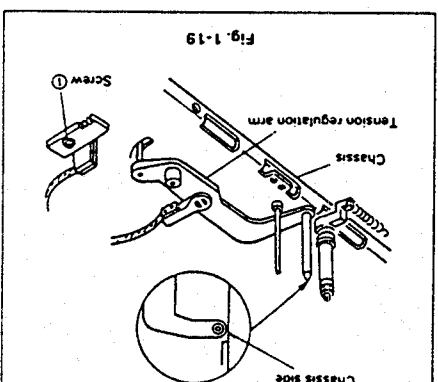
- 1-17. PINCH ARM SUB ASSEMBLY
- (1) Remove the ① retaining rings, then remove the pinch link plate assembly.
 - (2) Remove the ① retaining rings, and then remove the pinch arm sub assembly upwards.
 - (3) Replace the pinch arm sub assembly and assemble it into position by following the above procedure in reverse.



- 1-18. TENSION REGULATION BAND ASSEMBLY
- (1) Remove the ① band holder of the tension regulation band assembly from the tension regulation arm assembly. Next, remove the ① screw and remove the tension regulation band assembly (Fig. 1-18).
 - (2) Exchange the tension regulation band assembly with a new replacement and mount it into position by following the above procedure in reverse.
 - (3) Adjust the tension regulation arm assembly according to the following procedure.
- Caution: Excessive pressure on the lever during band holder replacement could bend it out of shape.



- 1-19. ADJUSTING THE TENSION REGULATION ARM POSITION
- (1) With the cassette housing removed, activate the play mode.
 - (2) Adjust the screw ① so that the left end of the tension regulation arm comes in alignment with the chassis side, secure it firmly as shown in Fig. 1-19.
- Note:
- If back tension is incorrect, check the tension pole position. Use the back tension cassette gauge and confirm a value of between 17 and 32 gcm. If necessary, replace the tension arm spring or tension band and readjust the tension pole position.



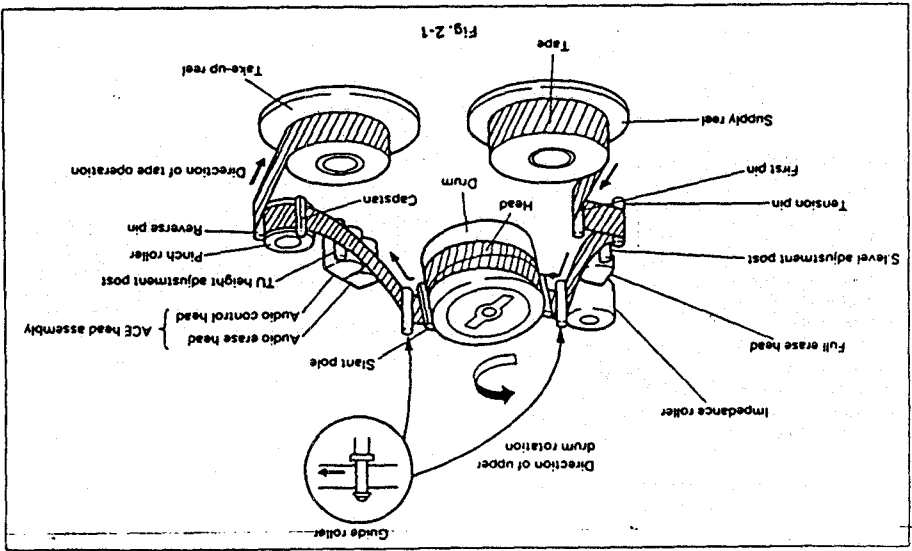
- 1-19. ADJUSTING THE TENSION REGULATION ARM POSITION
- (1) With the cassette housing removed, activate the play mode.
 - (2) Adjust the screw ① so that the left end of the tension regulation arm comes in alignment with the chassis side, secure it firmly as shown in Fig. 1-19.
- Note:
- If back tension is incorrect, check the tension pole position. Use the back tension cassette gauge and confirm a value of between 17 and 32 gcm. If necessary, replace the tension arm spring or tension band and readjust the tension pole position.

Because the VHS transport system is precision-adjusted at the factory, there is usually no need to readjust the system. Note that, however, after an extensive use or when any tape transport system parts have been replaced, it becomes necessary to check and adjust the tape path and tape transport system.

To wind the tape accurately around the tilted drum, the tape is guided by a pair of slanted guide posts (thrust poles) mounted to the left and right of the drum. The tape level during operation is determined by the pair of guide rollers.

2.1. TAPE PATH MECHANISM

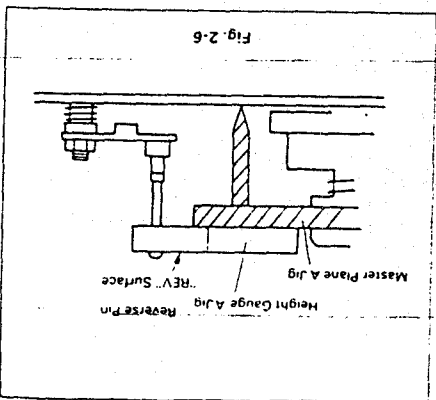
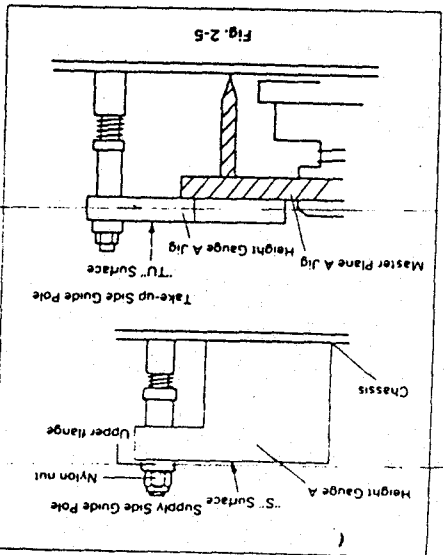
The VHS-system tape path is characterized by upper drum rotation with the video head to wind the tape around the drum in an M-shaped form.



2.2. CHECKING THE TAPE TRANSPORT SYSTEM

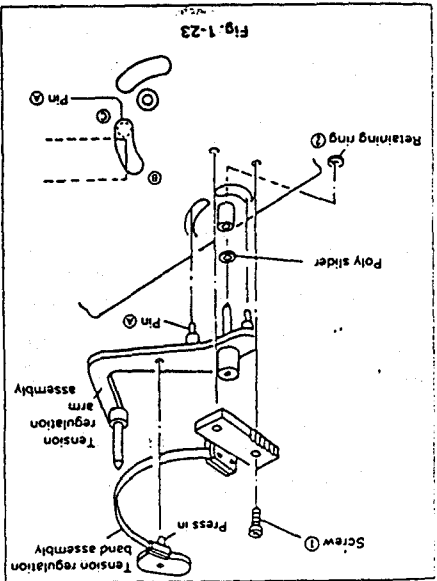
- (1) Use the E-120 cassette tape.
- (2) Use a cleaning cloth soaked in cleaning solution (isopropyl alcohol) to clean the tape transport system parts (tape guide, pinch roller, surface of drum, caps-tan shaft, pinch roller, surface of ACE and FE heads, etc.).
- (3) Use the reverse pin and sliver adjustment post via the path indicated by the arrows in Fig. 2-1.
- (4) In the PLAY, CUE, and REV modes, observe whether the tape is being wrinkled or not on the supply guide roller, supply guide pole, take-up guide roller, take-up roller, supply guide pole and reverse pin. If the tape is being wrinkled, make the necessary adjustments by referring to Fig. 2-5.
- (5) Operate the PLAY and STOP modes a few times to ensure proper operation.

- (1) Insert the E-120 cassette tape, and activate the PLAY mode.
- (2) As shown in Fig. 2-5, use the box driver (J-5) to precisely adjust the supply and take-up guide pole heights.
- (3) If tape wrinkling cannot be eliminated by the above adjustment, check the supply reel disk height, tension pin, and other parts.



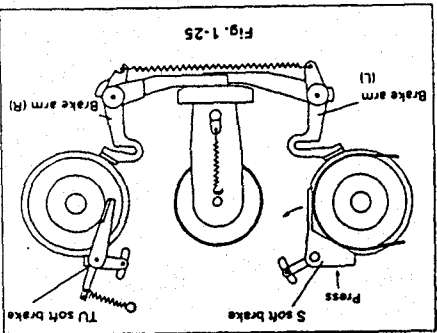
1.23. TENSION REGULATION ARM ASSEMBLY

- (1) Remove the screw, then remove the tension regulation band assembly from the tension regulation arm assembly.
- (2) Remove the retaining ring from the reverse side of the chassis.
- (3) Remove the tension regulation arm assembly upwards.
- (4) Replace the tension regulation arm assembly and mount it into position by following the above procedure in reverse.
- (5) When installing the tension regulation arm assembly into place, pin ① should be into position, as shown in Fig. 1-23.
- (6) Adjust the position of the tension regulation arm by referring to item 1-19.

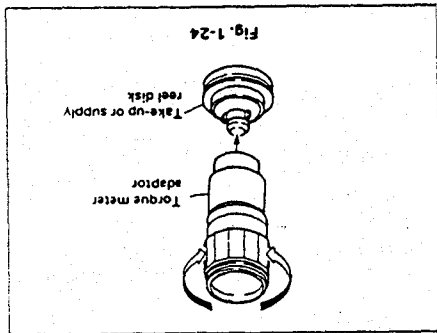


1.24. MEASURING AND CHECKING THE FWD REEL TORQUE

- (1) Remove the cassette housing and set the power button to ON while pressing the cassette IN switch then plug the AC cord. (Refer to item 1-5.)
- (2) Activate the FWD mode (the cassette IN switch can now be released).
- (3) Set the torque meter on the take-up reel disk base and measure the torque.
- (4) FWD torque rating: 150 gcm ± 23 gcm.
- (5) FF, REV torque rating: more than 400 gcm.



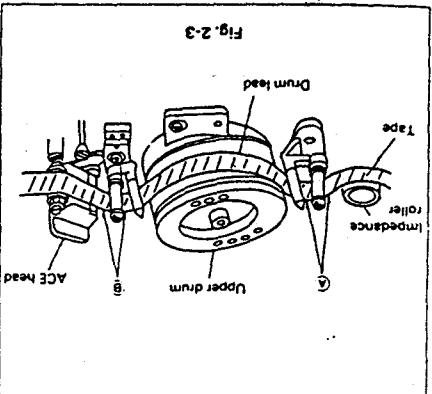
Notes:
1. When measuring the brake arm (R) TV reel torque, lightly push the TV soft brake so that it releases from the reel base, following the same procedure as for when measuring the torque of the S soft brake.
2. If the measured value deviates excessively from the appropriate values, carefully check the springs, etc.



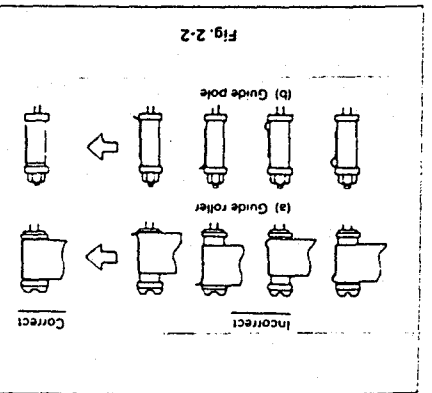
- (1) Remove the cassette housing.
- (2) Before measuring the torque of the brake arm (L), lightly push the S soft brake in the direction indicated by the arrow, then release the tension regulation band along together with the meter needle. Check that this value falls between 250 - 500 gcm.
- (3) Place a torque meter on the S reel base. Grasping the torque meter lightly, turn it clockwise, and read out the value when the meter face plate begins to move by the arrow.
- (4) Using the same procedure as above, lightly grasp the torque meter, turn the gauge counterclockwise, and read out the value when the meter face plate begins to move.

1.25. MEASURING AND CHECKING THE BRAKING TORQUE

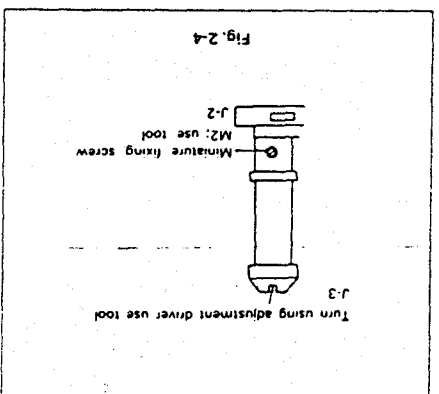
2.3. ADJUSTING THE TAPE TRANSPORT SYSTEM



- (6) In the PLAY, CUE, and REV modes, confirm that tape undulation does not occur at sections ① and ② shown in Fig. 2-3. To check section ①, remove the impedance roller from the tape.
- (7) Repeat the REV and CUE modes a few times after-ly to check that the tape does not move up and lower at the lower area of the ACE head.



- (1) To adjust the height of supply-side guide pole, set the Height Gauge A Jig (J-12) on the chassis as shown in Fig. 2-5, and use the nylon nut to adjust to the height of the lower surface of the upper flange.
- (2) To adjust the height of take-up-side guide pole, place the Master Plane A Jig (J-14) on the chassis, and place the Height Gauge A Jig (J-12) on J-14 with the side marked "TV" facing up as shown in Fig. 2-5. Then use the nylon nut to adjust to the height of the lower surface of the upper flange.



- (1) As shown in Fig. 2-4, loosen the fixing screws of the supply guide roller and take-up guide roller (until the guide rollers can be turned easily by using the adjustment screwdriver).

Only make these adjustments if a malfunction has been detected during the checking described in item 2-2.
Note: Be sure to carry out intercompatibility adjustments after the tape transport system has been adjusted, be sure to make the intercompatibility adjustments to ensure compatibility among parts.

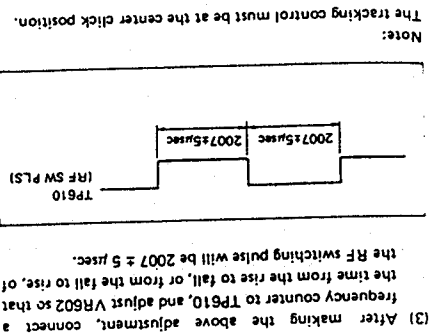
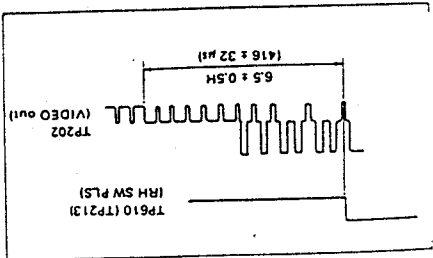
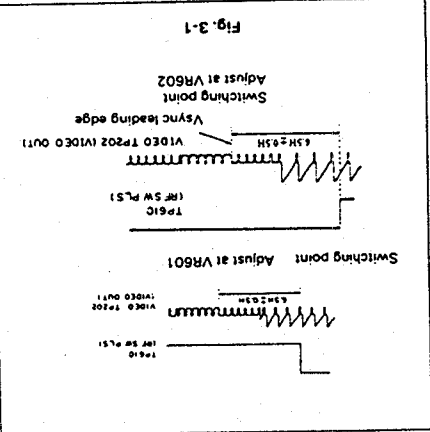
3. INTERCOMPATIBILITY ADJUSTMENTS

Because these adjustments have a significant effect on the picture quality in the respective modes, as well as affect the degree of tape intercompatibility, be sure to perform the following procedures very carefully and thoroughly.

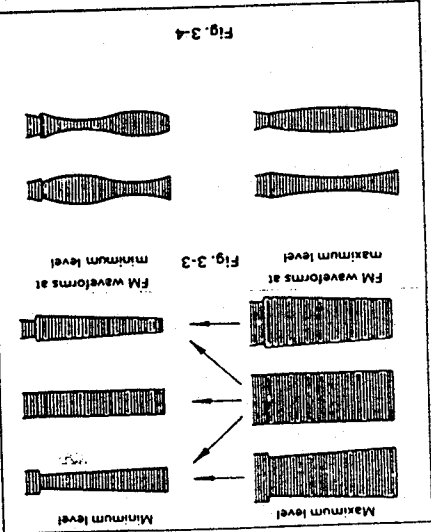
3-1. CHECKING THE FM WAVEFORMS (N9033G)

3-1-1 Check 1: checking the playback switching point (N9034G)

- (1) Play the alignment tape (MH-2).
- (2) Connect channel 1 of the oscilloscope to test pin TP-610 or TP-213 of the S/S/A/V circuit board.
- (3) Confirm that the interval from the RF switching pulse to the Vsync leading edge is at $6.5H \pm 0.5H$.
- (4) If not at $6.5H \pm 0.5H$, VR601 and VR602 on the S/S/A/V circuit board to set the interval at $6.5H \pm 0.5H$.



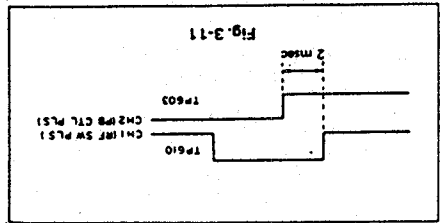
- (2) When various waveforms are observed as shown in Fig. 3-4, it is necessary to make the precise adjustments described in item 3-3.



3-2. COARSE ADJUSTMENT OF FM WAVEFORMS (Preliminary adjustments)

- (1) Use the hexagonal screwdriver (L-2) to loosen the fixing screws of the supply guide and take-up guide rollers so that the guide rollers can be adjusted.
- (2) Connect channel 1 of the oscilloscope to TP-211 of the S/S/A/V circuit board. Also connect TP-610 or TP-603 of the same circuit board to the oscilloscope.
- (3) Play back the MH-2 alignment tape.
- (4) While observing the waveforms on the oscilloscope, turn the tracking knob to set the FM waveform to the maximum level.
- (5) If the FM waveforms look like A in Fig. 3-5, adjust the supply guide roller until the waveforms look like B in Fig. 3-5.

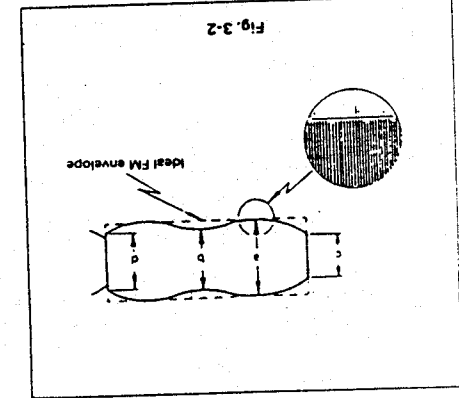
- (A) Adjusting subtracking
- (1) Connect channel 1 of the oscilloscope to test pin TP-610 or TP-213 of the S/S/A/V circuit board. Also connect channel 2 of the oscilloscope to test pin TP-603 of the same circuit board.
- (2) Play back the MH-2 alignment tape.
- (3) Adjust the volume VR-603 so that the leading edge of Vsync is synchronized with the leading edge of the RF switching pulse as shown in Fig. 3-11.



- (B) Adjusting the ACE head position
- (1) Connect channel 1 of the oscilloscope to test pin TP-211 of the S/S/A/V circuit board, and channel 2 of the oscilloscope to TP-610 or TP-213 of the same circuit board.
- (2) Play back the MH-2 alignment tape, set the tracking knob at the center position, and turn the taper pin Fig. 3-10 so that the maximum FM waveform output level is set. Play back the MH-2 alignment tape, and confirm that the maximum FM waveform output level is obtained with the tracking knob set at the center position.

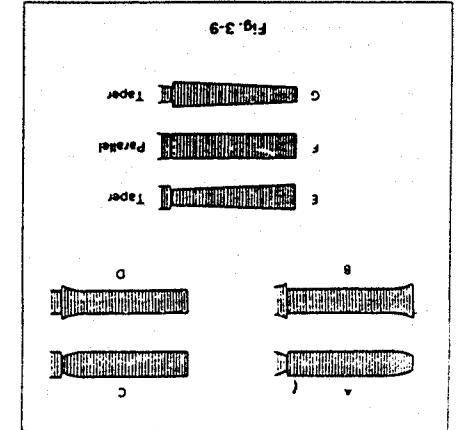
- (3) While observing the audio output signal on the oscilloscope, adjust the height adjustment nut (B) shown in Fig. 3-10 to the maximum output level.
- (4) Next, adjust the azimuth adjustment screw to the maximum output level.

- (3-1-2 Check 2: checking the FM waveform)
- (1) Connect channel 1 of the oscilloscope to test pin TP-211 of the S/S/A/V circuit board. Also connect TP-610 or TP-213 of the same circuit board to the oscilloscope as an external synchronization terminal.
- (2) Play back the MH-2 alignment tape.
- (3) Turn the tracking knob to set the FM waveform output is set to the maximum level.
- (4) Read the FM waveform level (a) as shown in Fig. 3-2.
- (5) Read the FM waveform level (b) as shown in Fig. 3-2, and check the following:
 - (a) $\frac{a}{b} \approx 0.8$
 - (b) $\frac{a}{b} \approx 0.8$
- (6) Read the FM waveform levels (c) (drum entrance) and (d) (drum exit), and check the following:
 - (c) $\frac{a}{c} \approx 0.8$
 - (d) $\frac{a}{d} \approx 0.8$

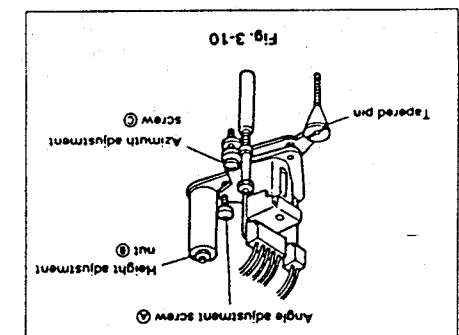


- Notes: 1. Read the minimum levels of (b), (c), and (d).
2. If the level values are within the above ranges, proceed to the following "Check 3-2".
3. If any malfunction is detected, follow the coarse FM waveform adjustment procedure described in item 3-2.
- 3-1-3 Check 3
- (1) As previously mentioned in Check 2 (connect the oscilloscope and play back the tape), turn the tracking knob while observing the FM waveforms. Confirm that the waveforms change linearly as shown in Fig. 3-3. When this linear change is confirmed, proceed to the ACE head height and azimuth adjustments described in item 3-4.

- Note: After completing these adjustments, confirm that the tape transport operation is functioning properly, and carefully tighten the fixing screws.

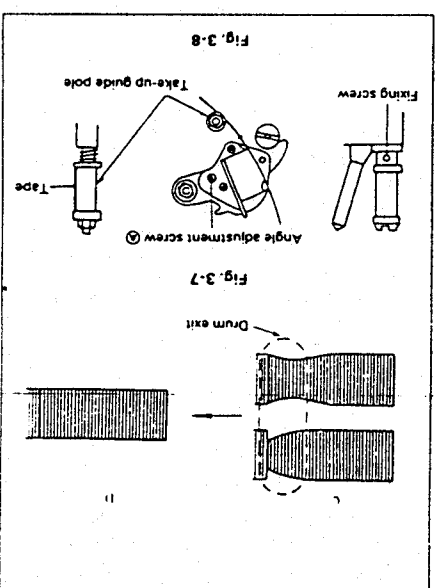


- (1) Connect channel 1 of the oscilloscope to the AUDIO OUT jack on the rear panel.
- (2) Play back the MH-2 alignment tape and reproduce the 7 kHz audio signal.
- (3) While observing the audio output signal on the oscilloscope, adjust the height adjustment nut (B) shown in Fig. 3-10 to the maximum output level.
- (4) Next, adjust the azimuth adjustment screw to the maximum output level.

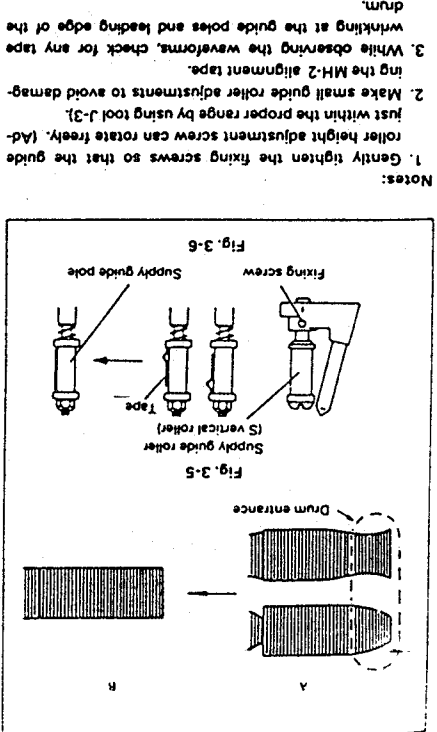


3-3. FINE ADJUSTMENT FOR INTER-COMPATIBILITY

- (1) Connect the oscilloscope to test pin TP-211 of the S/S/A/V circuit board. Also connect the oscilloscope to TP-610 or TP-213 of the same circuit board as an external synchronization terminal.
- (2) Play back the MH-2 alignment tape.
- (3) While observing the waveforms on the oscilloscope, turn the tracking knob to set the FM waveforms to the minimum levels.
- (4) If the waveforms look like A or B in Fig. 3-9, minimize the FM waveform output by carefully adjusting the supply guide roller until the waveforms look like E, F, or G in Fig. 3-9.
- (5) If the waveforms look like C or D in Fig. 3-9, minimize the FM waveform output by carefully adjusting the take-up guide roller until the waveforms look like E, F, or G in Fig. 3-9.
- (6) While turning the tracking knob to adjust the maximum and minimum levels of FM waveform output, adjust the supply and take-up guide rollers until the waveforms look like E, F, or G in Fig. 3-9.

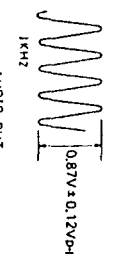


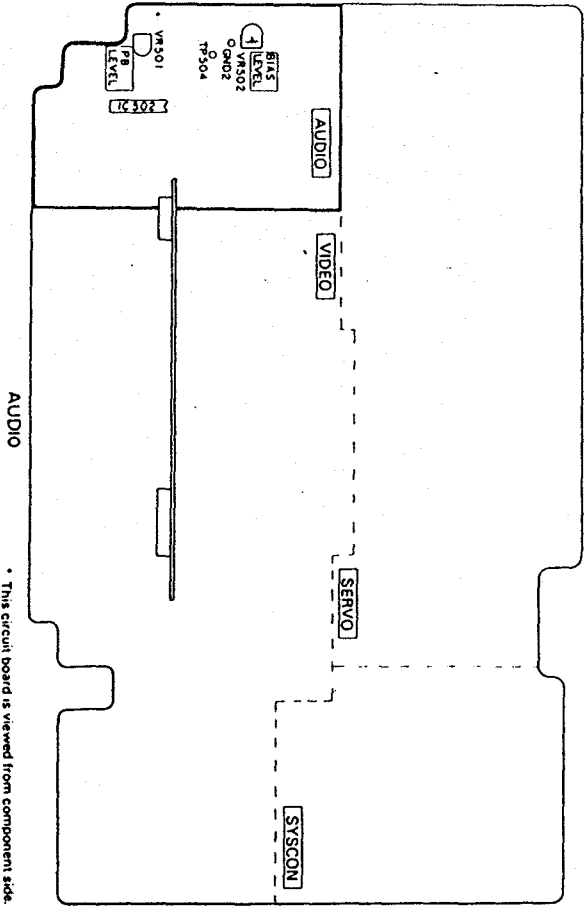
- (1) Adjust the FM waveforms by using the same procedure as used for drum entrance adjustment (by turning the take-up guide roller). If the waveforms look like C in Fig. 3-7, adjust the take-up guide roller until the waveforms look like D.



- Notes: 1. Gently tighten the fixing screws so that the guide roller height adjustment screw can rotate freely. (Adjust within the proper range by using tool J-3).
2. Make small guide roller adjustments to avoid damaging the MH-2 alignment tape.
3. While observing the waveforms, check for any tape wrinkling at the guide poles and leading edge of the drum.

4-3 AUDIO CIRCUIT (S/S/A/V board)

No.	Item	Check point	Adjustment Parts	Signal & Mode	Description and Waveform
1	PB Level	AUDIO Output Terminal	VR501 (PB LEVEL)	- Alignment Tape MH-2 - Play Back	Adjust VR501 so that the output level of the AUDIO output terminal is set to -8 ± 1 dB. (Oscilloscope display: 0.87 ± 0.12 Vp-p.) 
2	Head Bias	S/S/A/V board TP504, GND2	VR502 (BIAS CUR-RENT)	- No signal is input - REC mode	Adjust VR502 so that the voltage between TP504 @ and GND2 terminal @ (displayed on the AC millivoltmeter) of the S/S/A/V board is set to 100 ± 10 mVrms.



2-50

4-5 VIDEO CIRCUIT (S/S/A/V board)

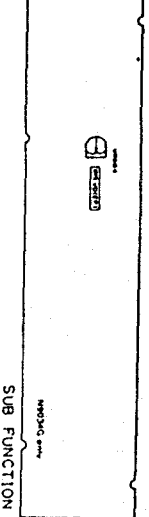
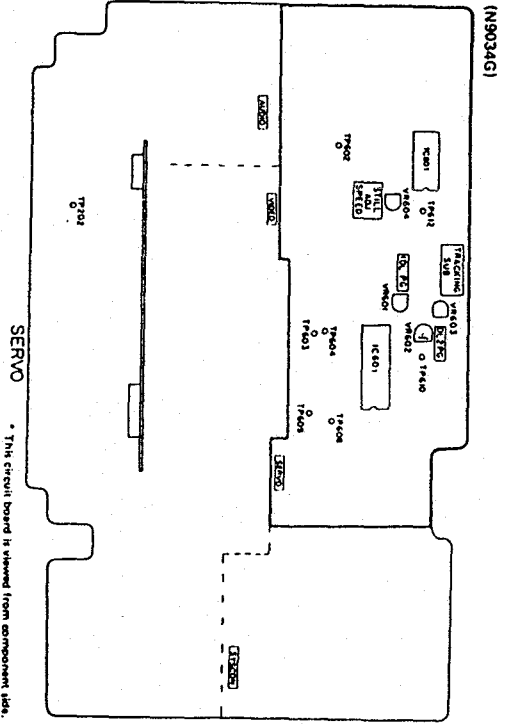
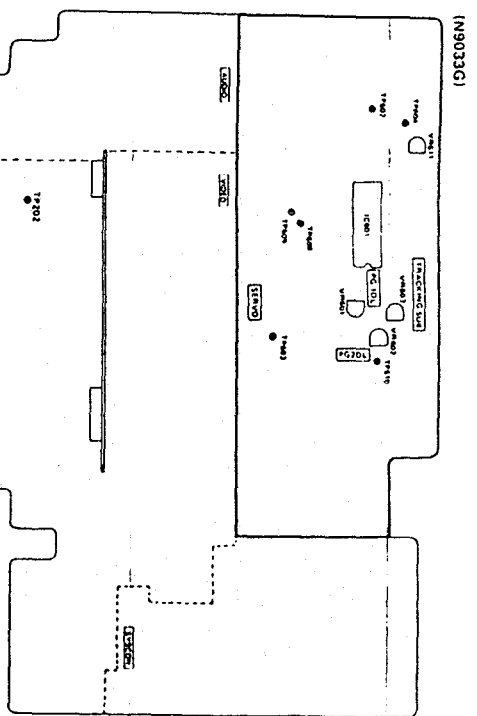
No.	Item	Check point	Adjustment Parts	Signal & Mode	Description and Waveform
1	EE Level	TP202 (Trigger: TP206)	VR201	Input (VIDEO-IN): PAL Color Bar STOP	- Input the PAL color bar signal to VIDEO IN. - Connect an oscilloscope to TP202. (Terminate VIDEO OUT with 75-ohm impedance.) - Adjust VR201 (EE) so that signal issued from sync tip to white peak is set to 1.05 ± 0.05 Vp-p.
2	Carrier Deviation	TP208	VR203	REC	- Set the INPUT SELECT switch to LINE. - Set the REC mode and connect the frequency counter to TP208. - Adjust VR203 (CARRIER) so that the frequency is set to 3.80 ± 0.05 MHz. - Play back the color bar section of MH-2, and connect an oscilloscope to TP202. - Adjust VR206 so that the amplitude of the playback color bar signal is set to $1.0V \pm 0.05$ Vp-p. - Input the PAL color bar signal to the VIDEO IN terminal and record it. Then play this signal back. Connect an oscilloscope to TP202 to measure the amplitude of the playback color bar signal. - When the measured value is within 1.0 ± 0.1 Vp-p, proceed to the following item. - When the measured value is not in the 1.0 ± 0.1 Vp-p range, adjust according to procedure 7.

TP202 (Trigger: TP-206) VR206 MH-2

VR204

7. Set the unit into the STOP mode:
a) When the measured value is less than 0.9 Vp-p, rotate VR204 (DEV) clockwise by approx. 10 degrees while observing the PC board from the soldered surface. (Note: When VR204 is rotated clockwise while observing the board from the soldered surface, the amplitude of the recording signal is increased. When it is rotated counterclockwise, the amplitude of the recording signal is decreased.)
Then record the color bar signal and play it back to confirm that the amplitude is within 1.0 ± 0.1 Vp-p. If the amplitude does not satisfy this range, repeat this procedure as required. If the amplitude is too large, rotate VR204 counterclockwise and confirm through recording and playback.
b) When the measured value exceeds 1.1 Vp-p, rotate VR204 (DEV) counterclockwise by approx. 10 degrees while observing the board from the soldered surface. Then record the color bar signal and play it back to confirm that the amplitude is within 1.0 ± 0.1 Vp-p. If the amplitude is too small, adjust VR204 in the same manner as noted in item a). If the amplitude is too large, repeat this procedure is required.

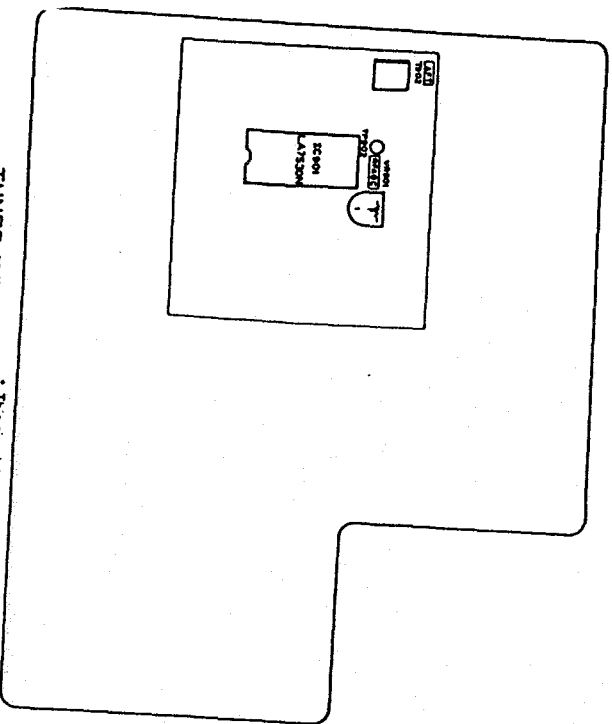
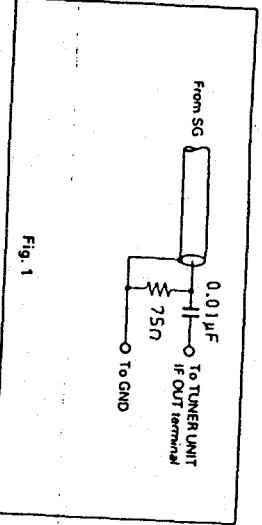
2-52



2-49

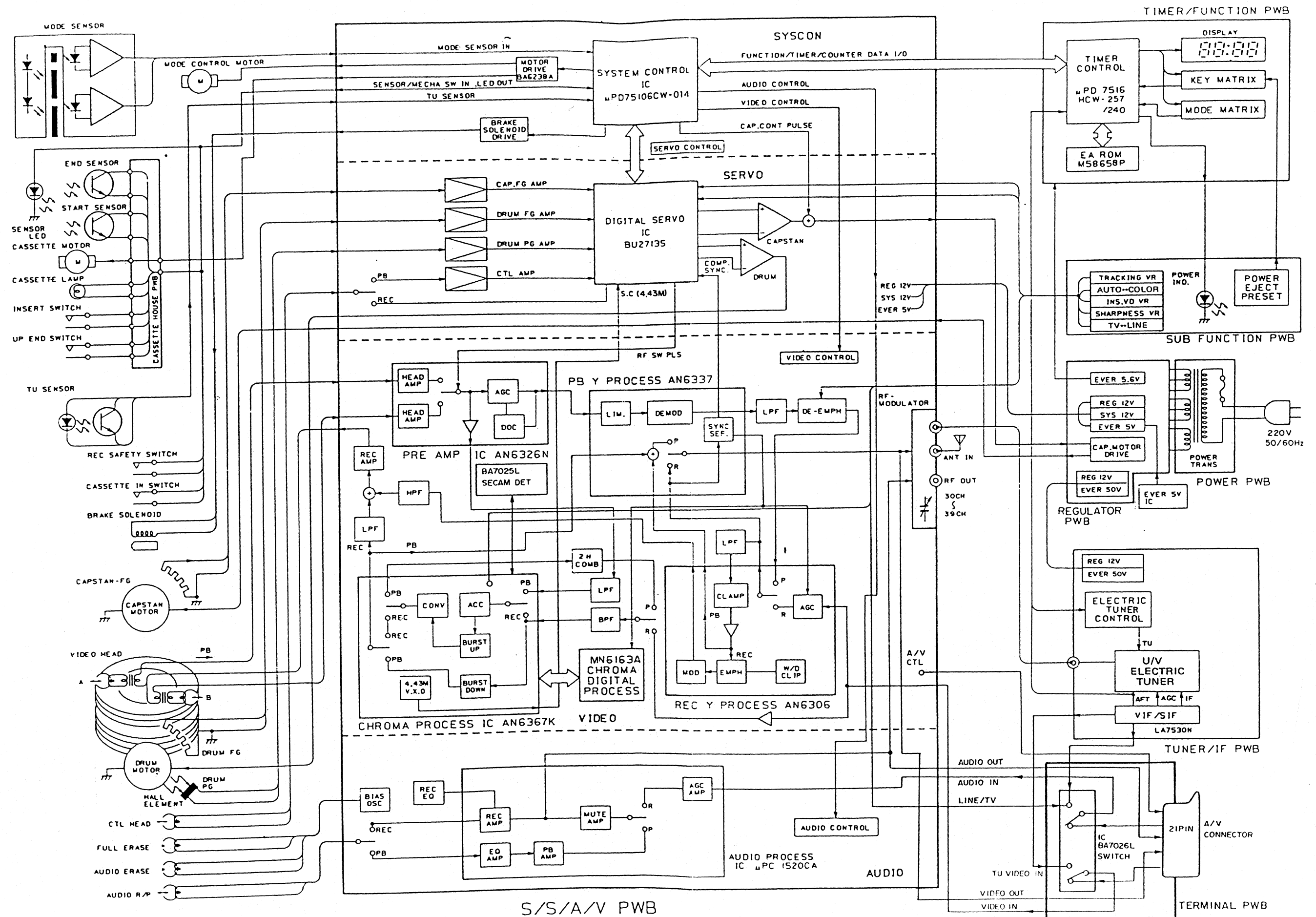
4-4 TUNER/IF CIRCUIT

1	AFT transformer adjustments (1) Connect the 38.7 MHz, 80 dB unmodulated signal to the IF output terminal of the Tuner Unit, by using the input pad shown in Fig. 1. Note that no signal is being input to the ANT IN terminal at this time.
2	RF AGC adjustments (1) Input the EACH, 49 dBc signal to the ANT IN terminal. (2) Connect a digital voltmeter to AGC terminal of the TUNER UNIT, and adjust VR901 (RF AGC) so that the voltage at the AGC terminal is set to 6.0 ± 0.5 VDC.



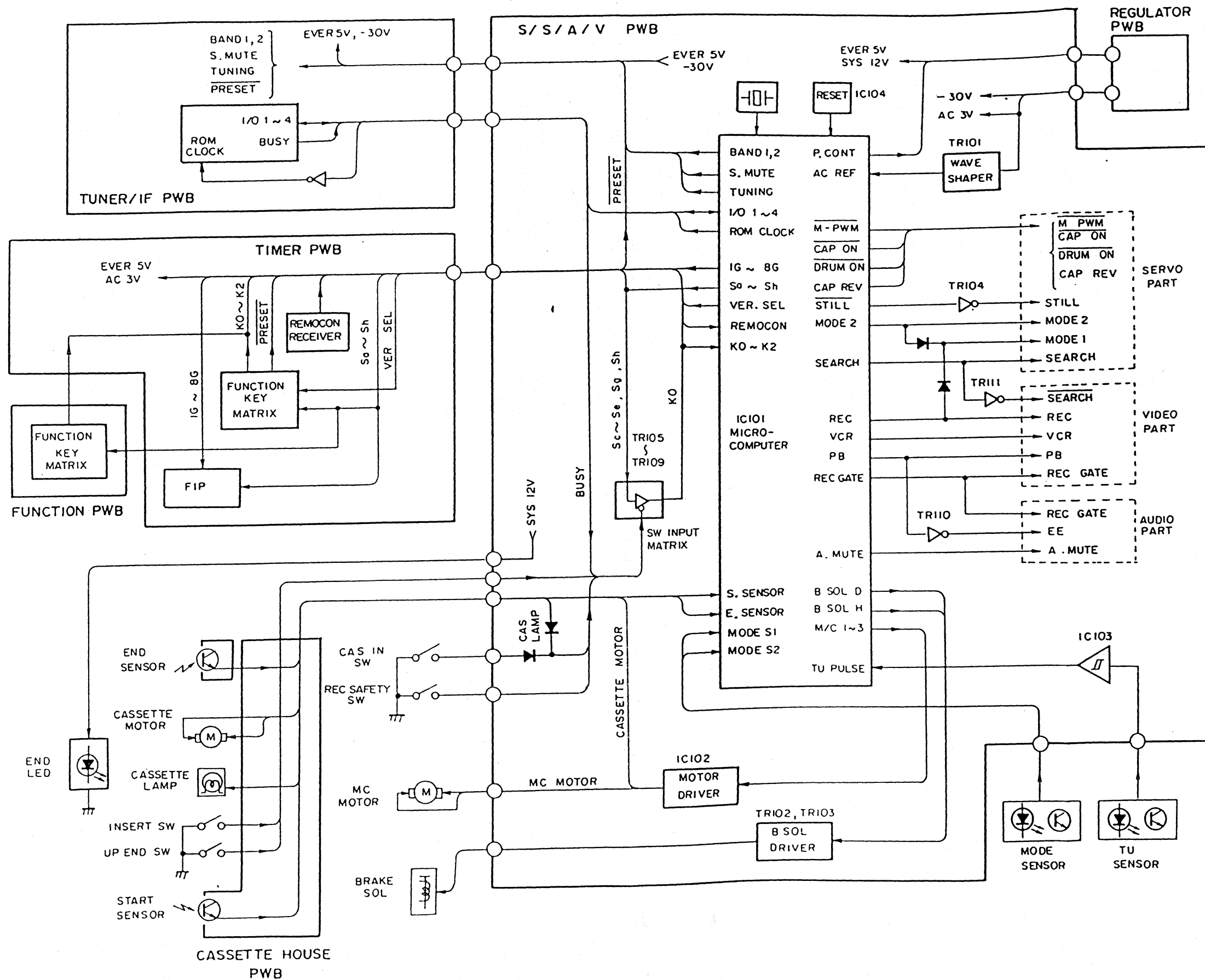
2-51

1-1. GENERAL BLOCK DIAGRAM (N9034G)

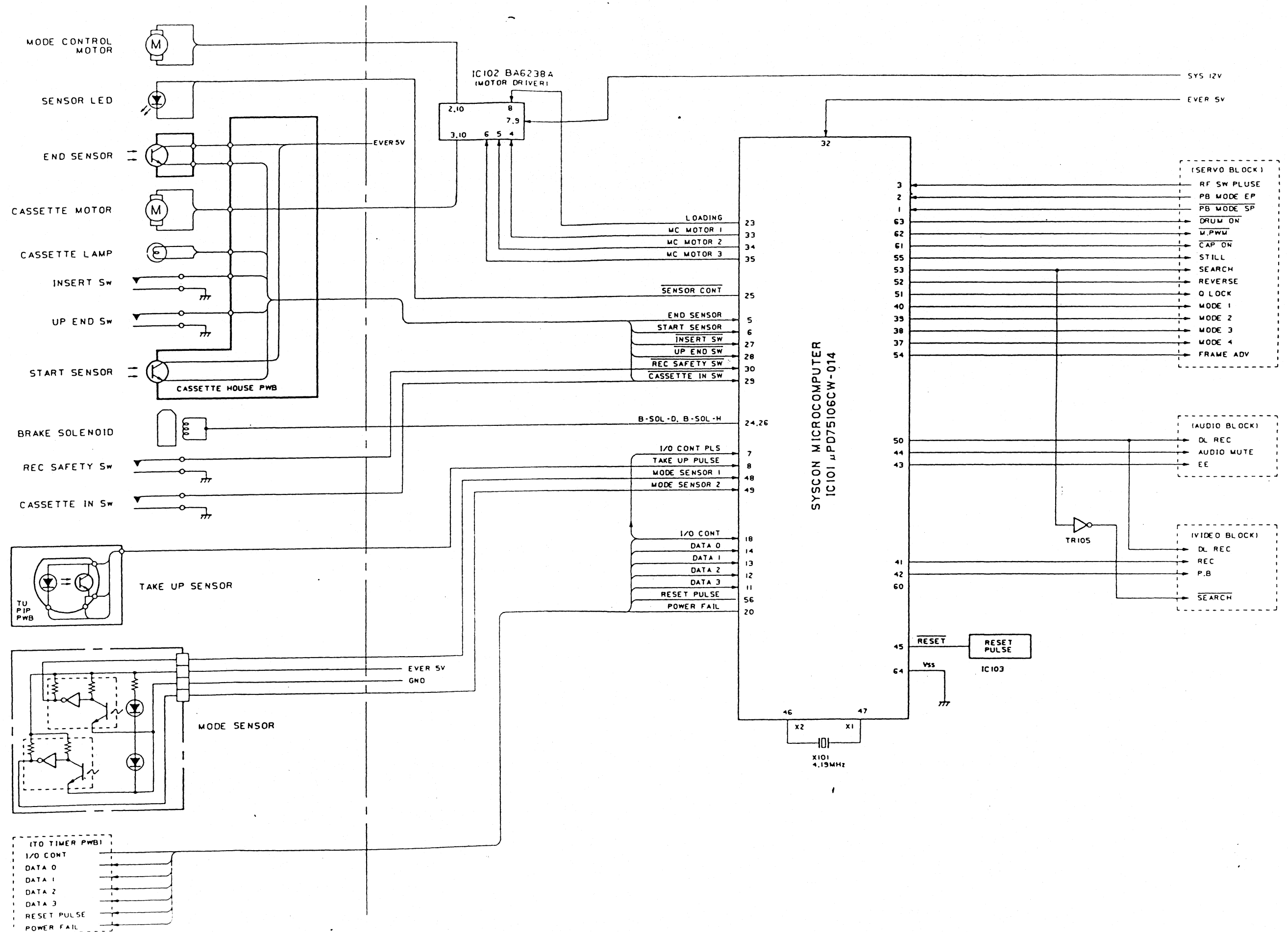


2. BLOCK DIAGRAMS

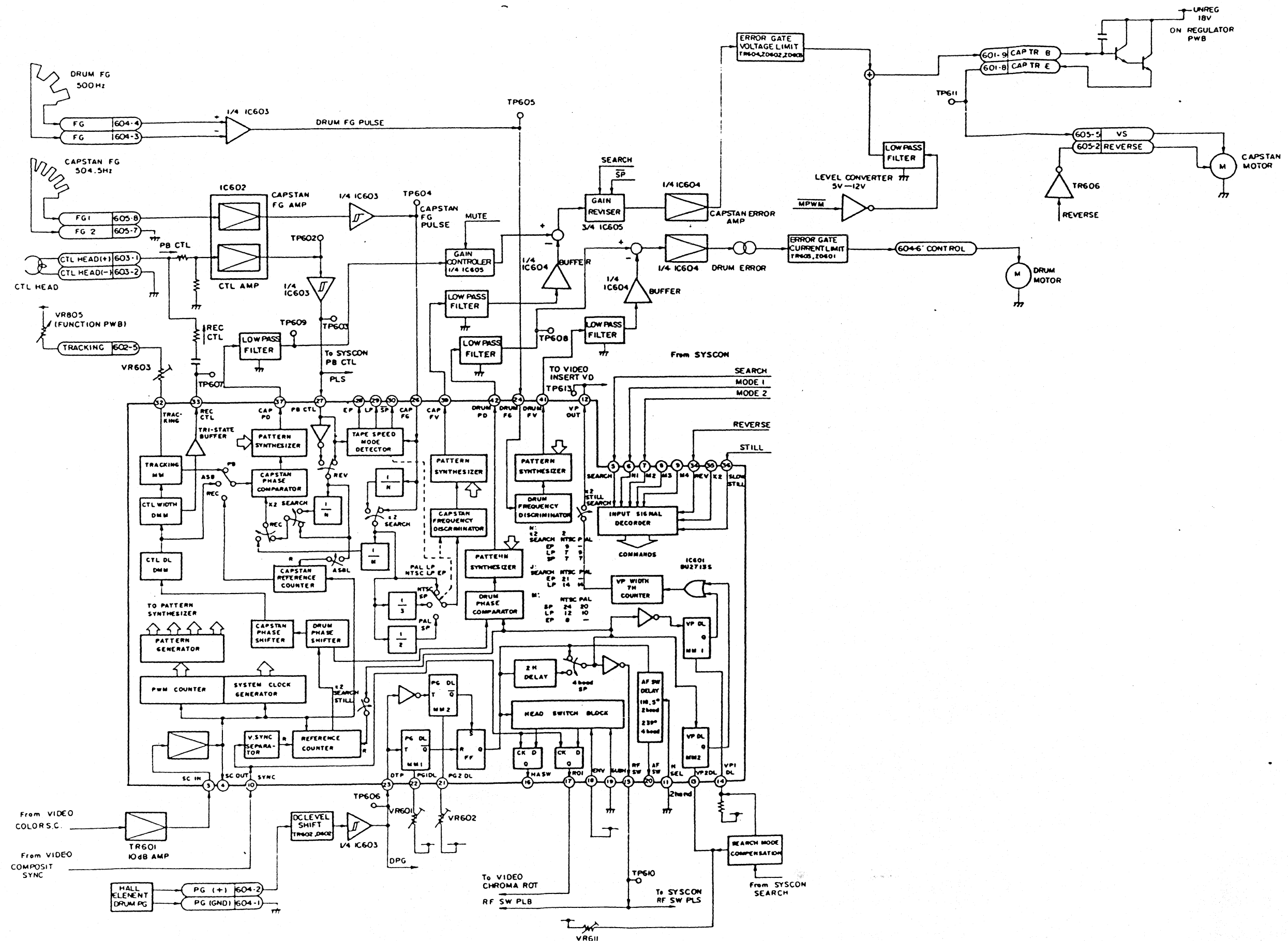
2-1. SYSCON TIMER BLOCK DIAGRAM (N9033G)



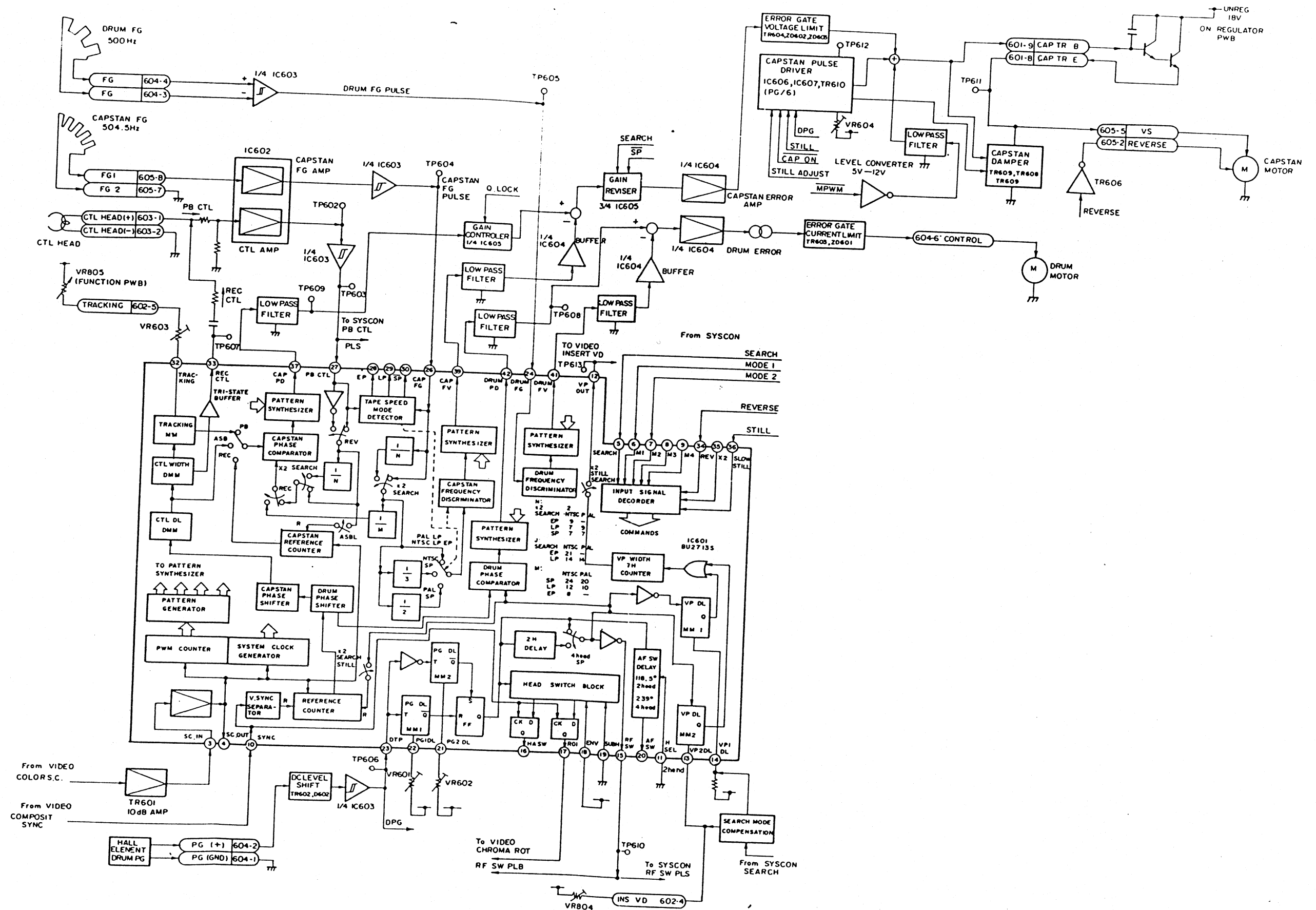
2-2. SYSTEM CONTROL BLOCK DIAGRAM (N9034G)



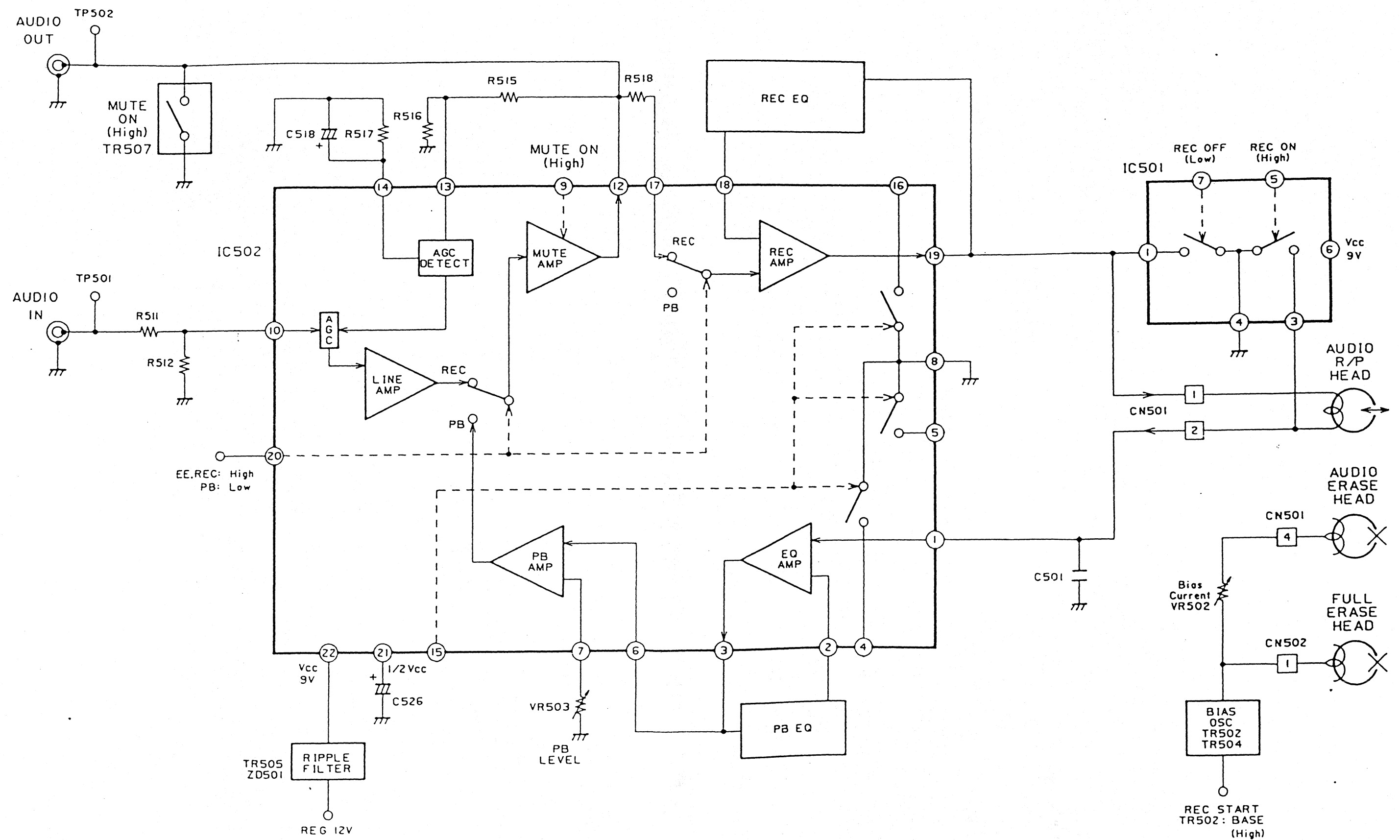
2-3. SERVO SYSTEM BLOCK DIAGRAM (N9033G)



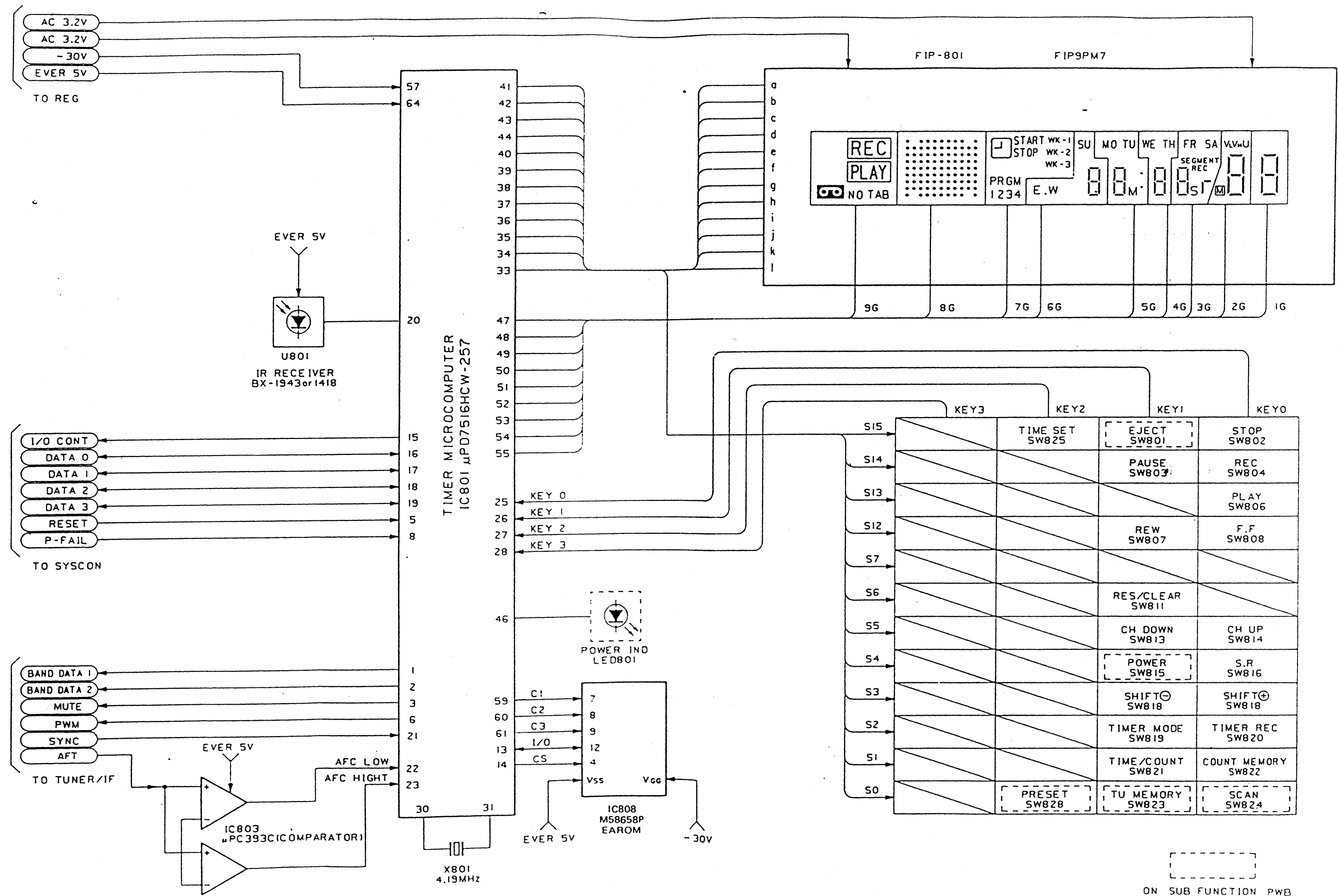
2.4. SERVO SYSTEM BLOCK DIAGRAM (N9034G)



2-5. AUDIO BLOCK DIAGRAM (N9033G/N9034G)



2-6. TIMER/FUNCTION BLOCK DIAGRAM (N9034G)

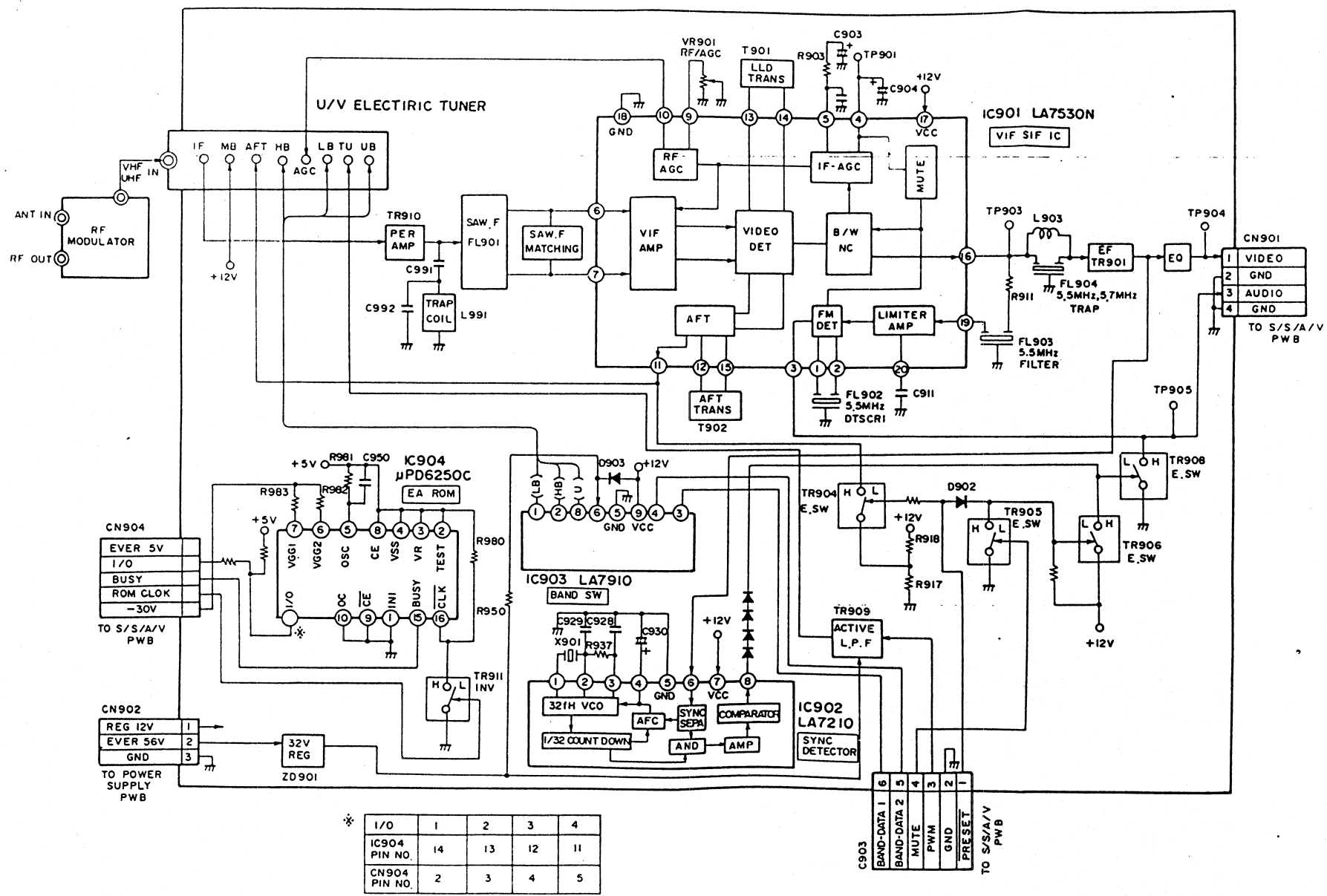


The diagram illustrates the internal circuitry of a video receiver, organized into two main sections: the S/S/A/V PWB (VIDEO) and the CHROMA PWB.

S/S/A/V PWB (VIDEO) Section:

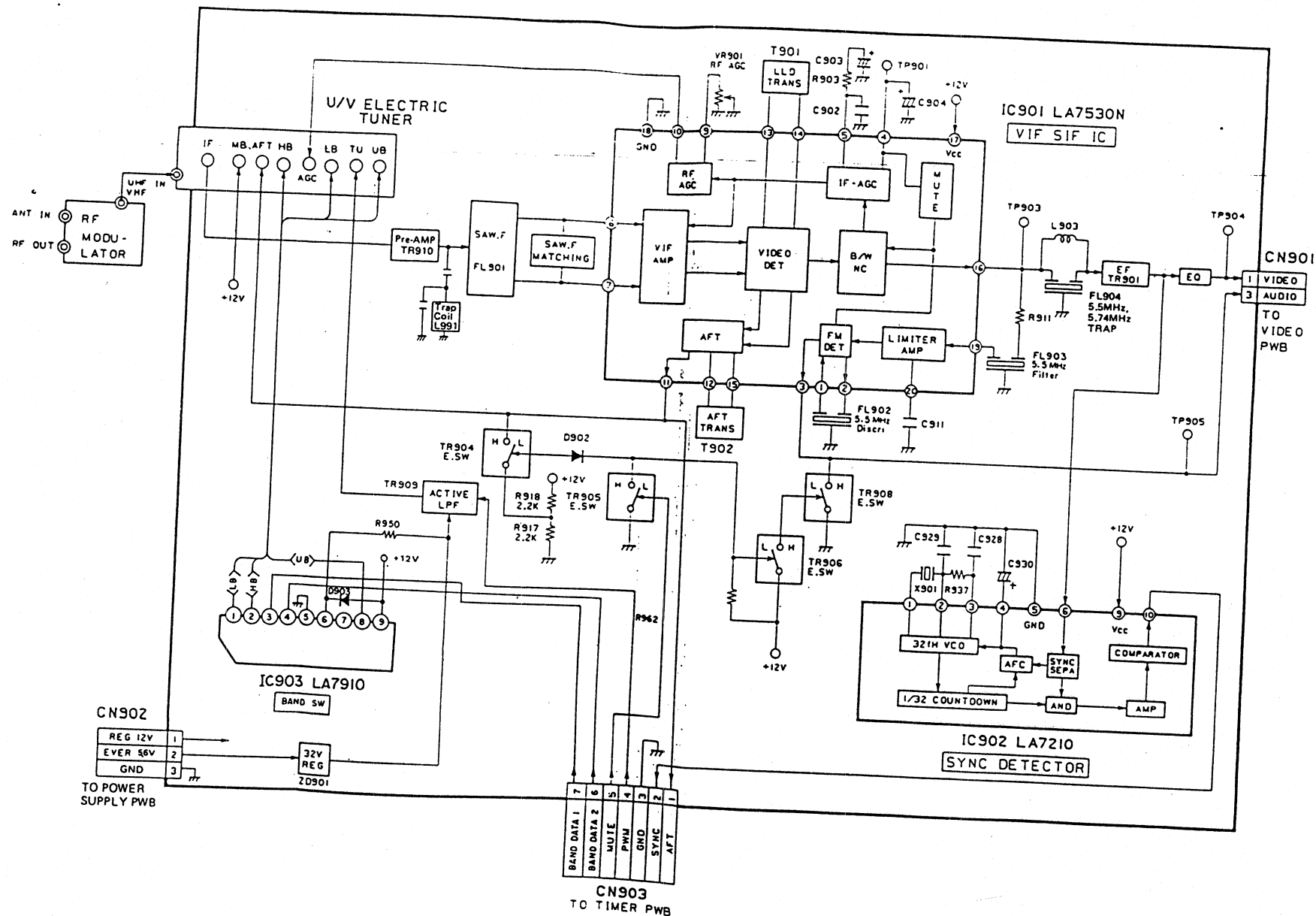
- Inputs:** Includes a 21PIN connector, A/V CTL, LINE/TV, VIDEO IN, AUDIO IN, AUDIO OUT, TU AUDIO IN, and TU VIDEO IN.
- IC1 BA7026L SWITCH:** A switch component at the top left.
- IC201 AN6306:** The main video processor, handling AGC (Automatic Gain Control), PLS (Phase-Locked Loop), CLAMP, and various amplifiers (AGC AMP, AGC DET, REC AMP, PB AMP).
- IC202 AN6337:** A video processor handling E.E. VIDEO SIGNAL, 3.2MHz L.P.F., SYNC SEPARATOR, and LIMITER.
- IC203 AN6326N:** A video processor handling NON LINEAR EMPHASIS, R.C. NETWORK, IN DELAY LINE, EQUALIZER, and A.G.C. AMP.
- Other Components:** VR201, VR202, VR203, VR204, VR205, VR206, VR207, VR208, VR209, VR210, VR211, VR212, VR213, VR214, VR215, VR216, VR217, VR218, VR219, VR220, VR221, VR222, VR223, VR224, VR225, VR226, VR227, VR228, VR229, VR230, VR231, VR232, VR233, VR234, VR235, VR236, VR237, VR238, VR239, VR240, VR241, VR242, VR243, VR244, VR245, VR246, VR247, VR248, VR249, VR250, VR251, VR252, VR253, VR254, VR255, VR256, VR257, VR258, VR259, VR260, VR261, VR262, VR263, VR264, VR265, VR266, VR267, VR268, VR269, VR270, VR271, VR272, VR273, VR274, VR275, VR276, VR277, VR278, VR279, VR280, VR281, VR282, VR283, VR284, VR285, VR286, VR287, VR288, VR289, VR290, VR291, VR292, VR293, VR294, VR295, VR296, VR297, VR298, VR299, VR300, VR301, VR302, VR303, VR304, VR305, VR306, VR307, VR308, VR309, VR310, VR311, VR312, VR313, VR314, VR315, VR316, VR317, VR318, VR319, VR320, VR321, VR322, VR323, VR324, VR325, VR326, VR327, VR328, VR329, VR330, VR331, VR332, VR333, VR334, VR335, VR336, VR337, VR338, VR339, 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2-9. TUNER/IF BLOCK DIAGRAM (N9033G)



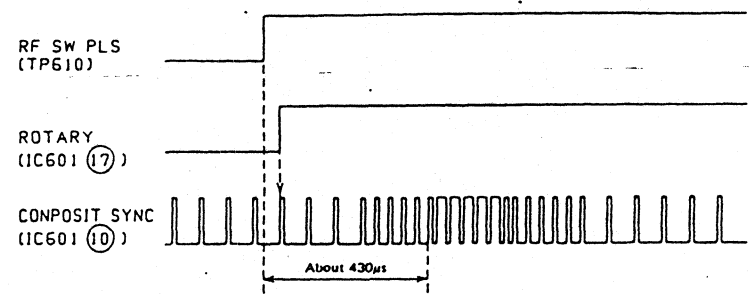
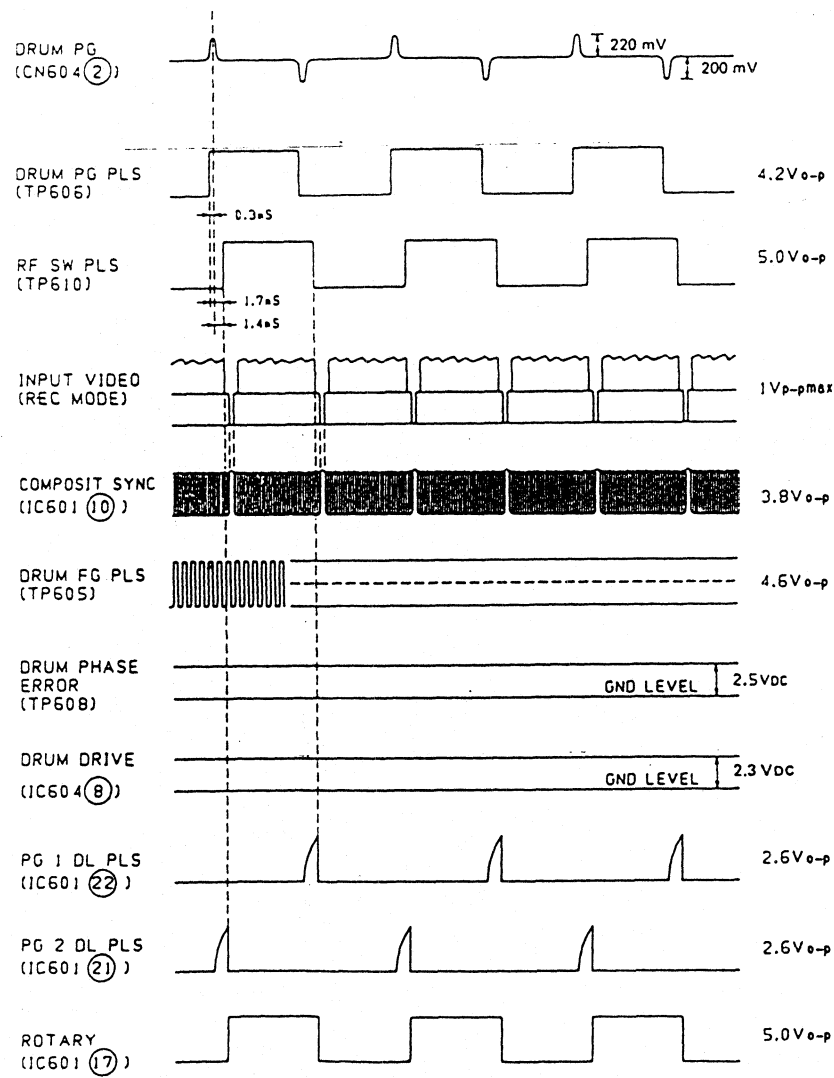
3-11

2-10. TUNER/IF BLOCK DIAGRAM (N9034G)



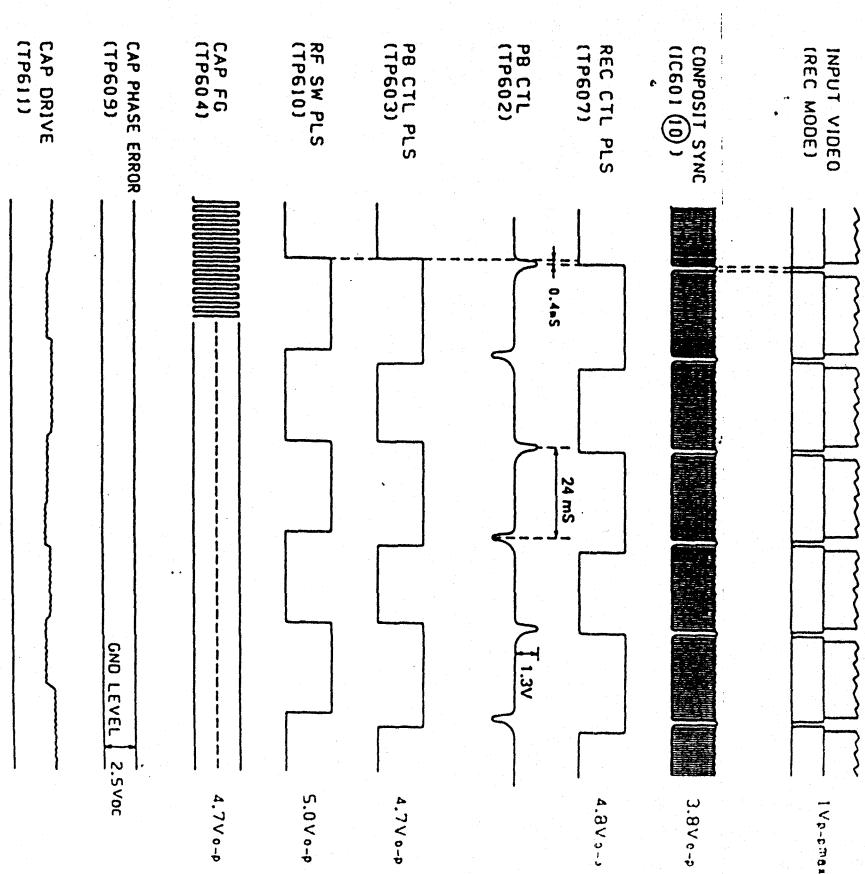
3. TIMING CHART (N9033G/N9034G)

3-1. DRUM SERVO TIMING CHART

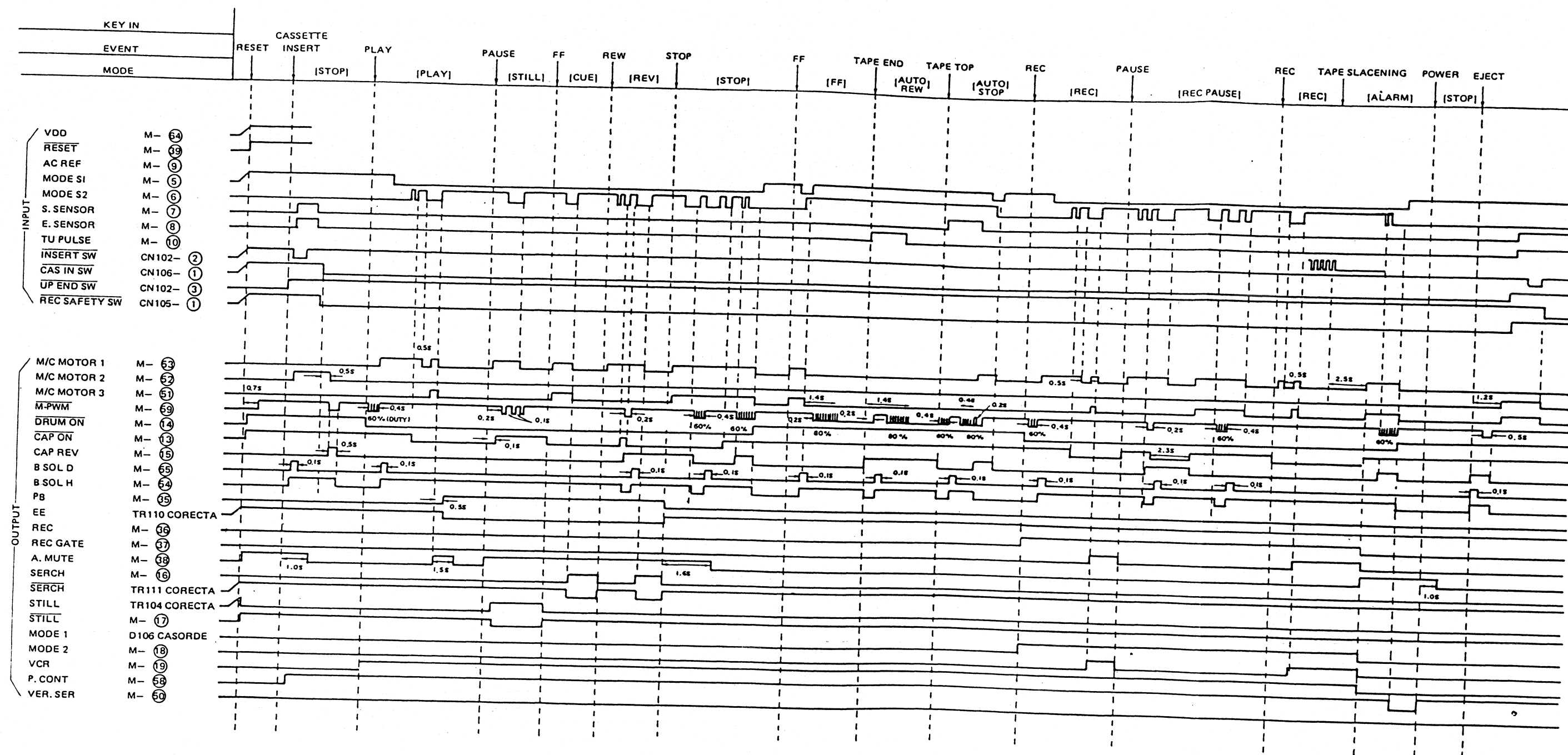


ITEMS	MODE	NORMAL (REC, PB)	CUE	REVIEW
		SP	SP	SP
RF SW PLS Freq. (Hz)		REC 25.00 PB 24.99	25.73 $\pm$ 0.1	24.07 $\pm$ 0.1
DRUM FG Freq. (Hz)		REC 500.0 PB 499.8	514.6 $\pm$ 2.0	481.3 $\pm$ 2.0
CAP FG Freq. (Hz)		504.6	3638 $\pm$ 17	3401 $\pm$ 17
CAP DRIVE Voltage TP611 (DC)		Approx. 3.3	Approx. 6.8	Approx. 6.2

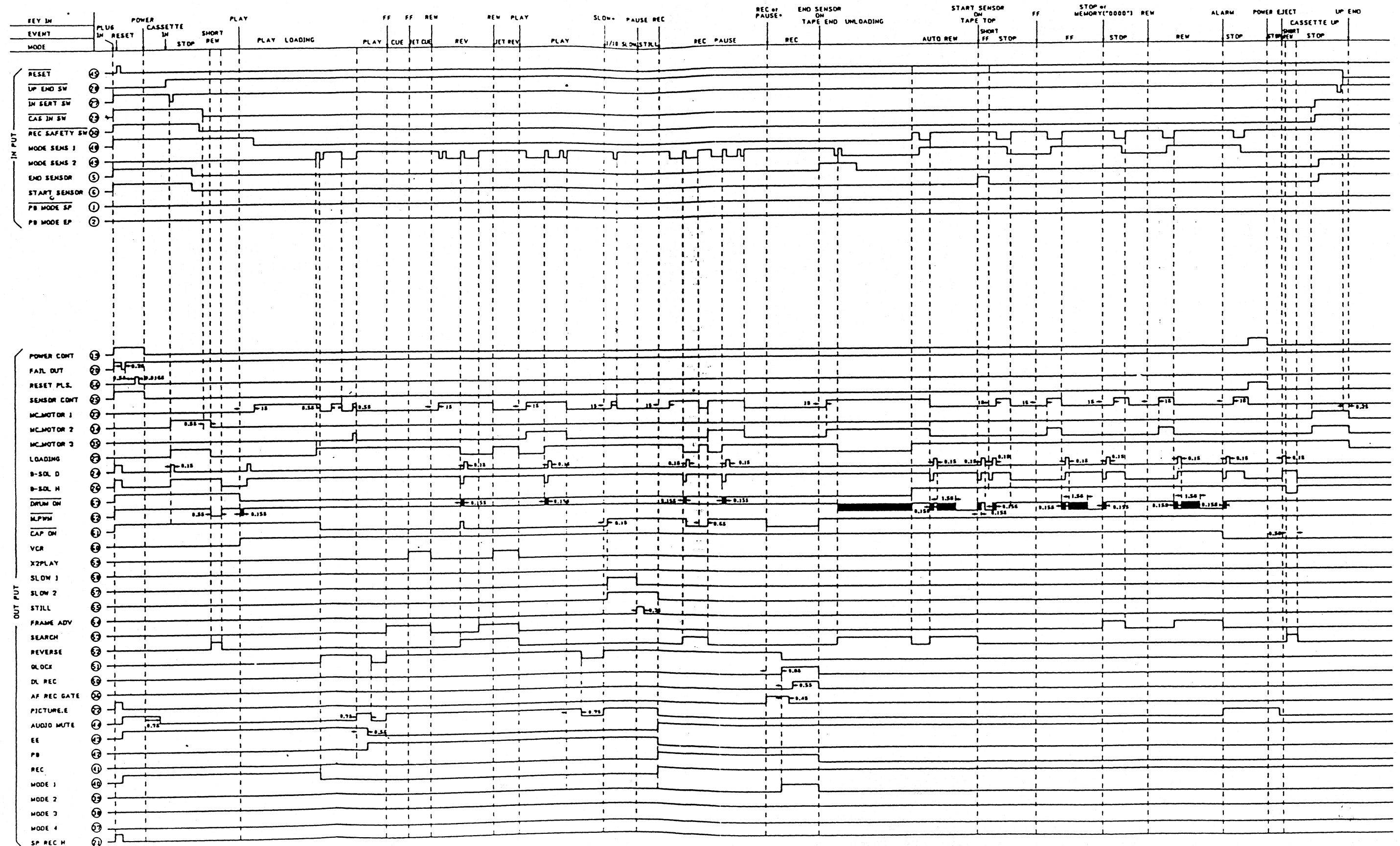
3-2. CAPSTAN SERVO TIMING CHART



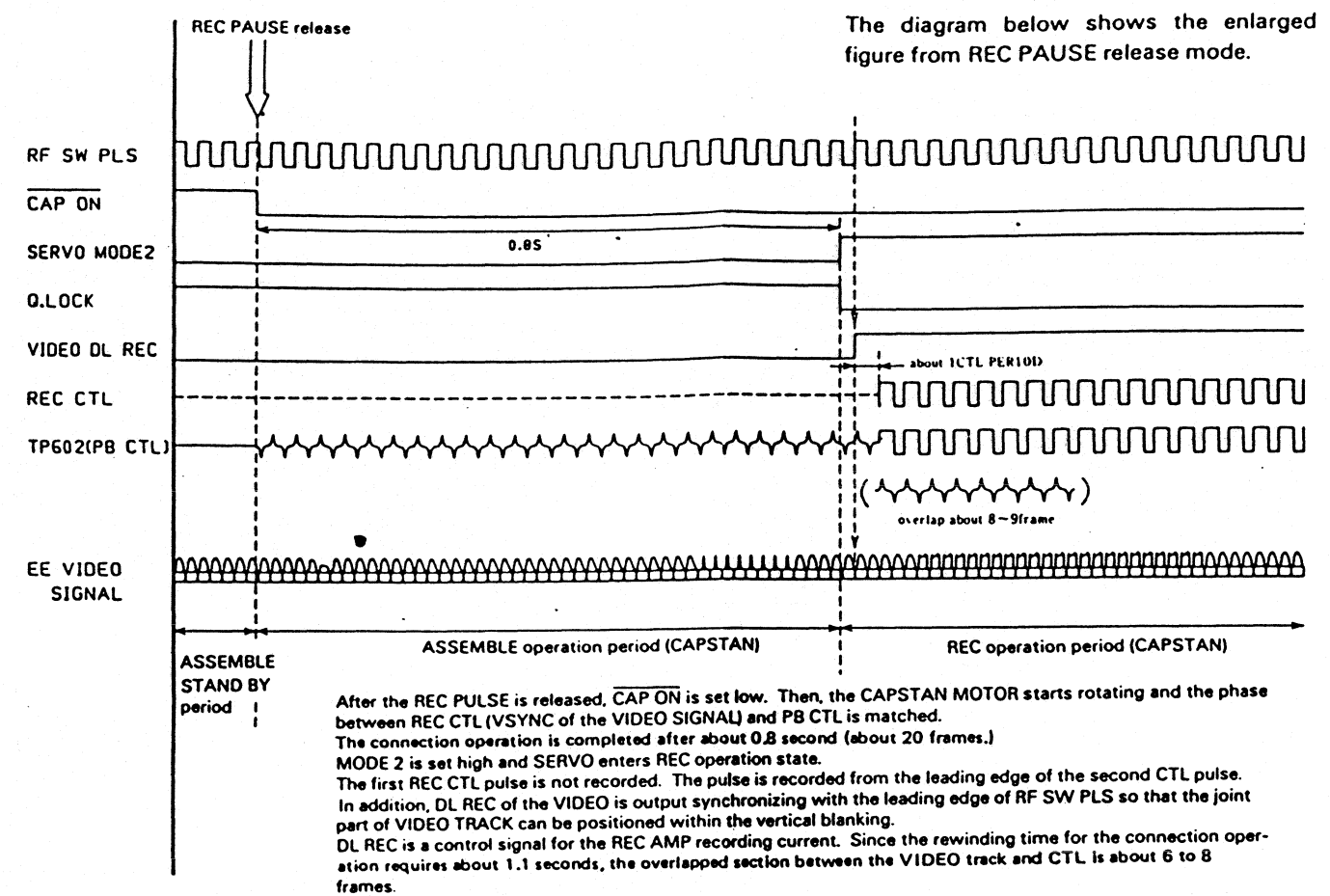
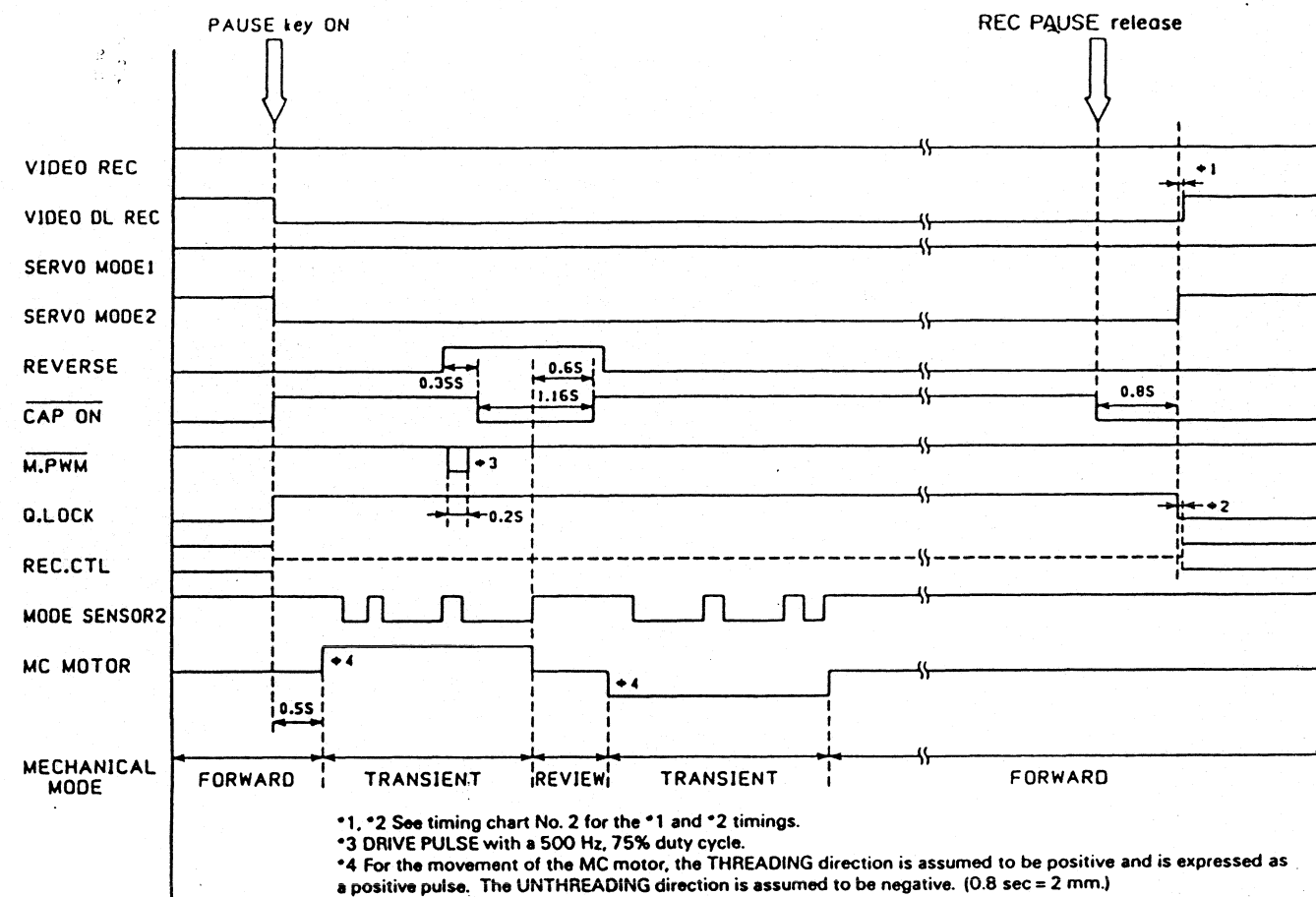
3-3. SYSTEM CONTROL TIMING CHART (N9033G)



3-4. SYSTEM CONTROL TIMING CHART (N9034G)



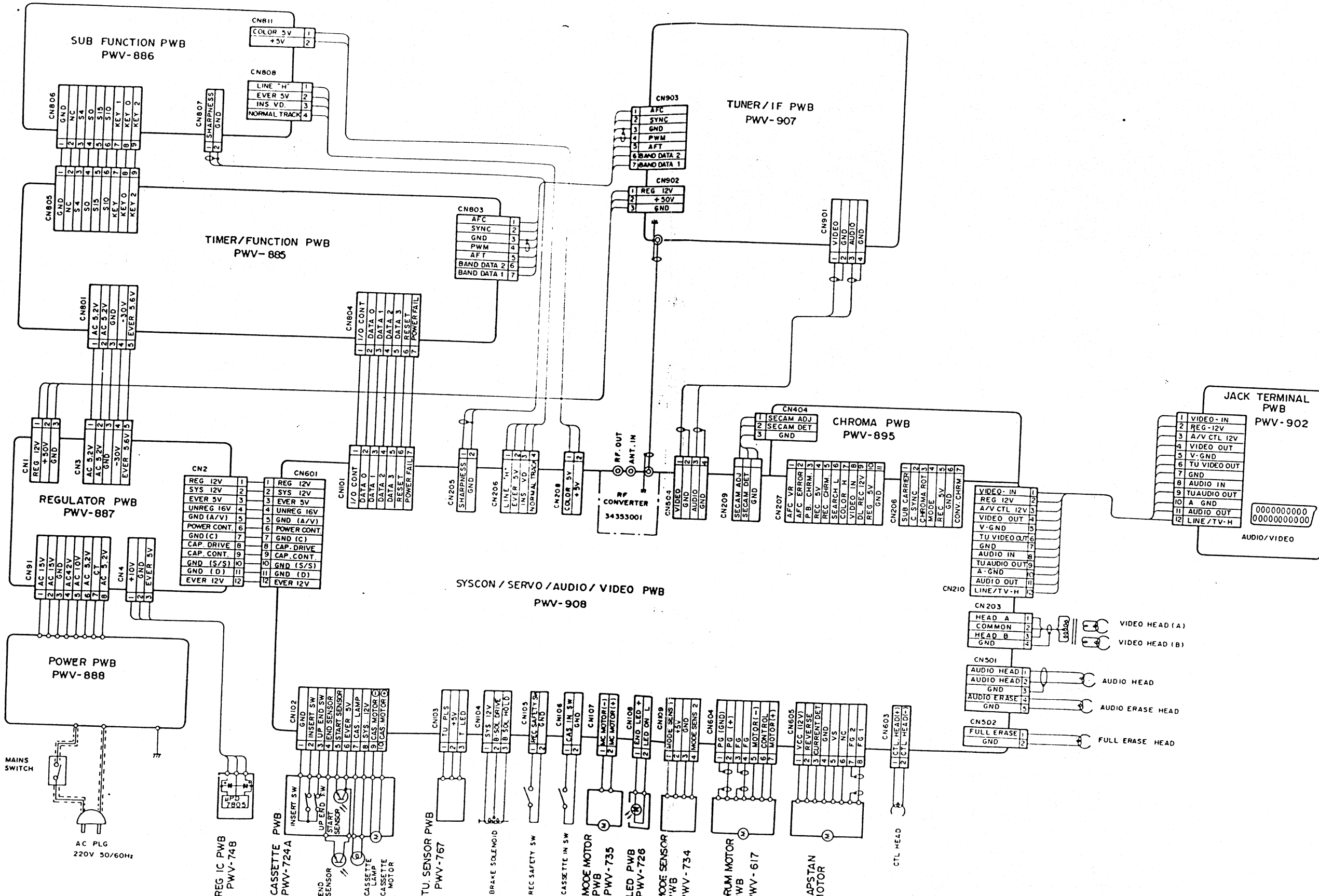
3-5. SYSTEM CONTROL TIMING CHART (N9034G)



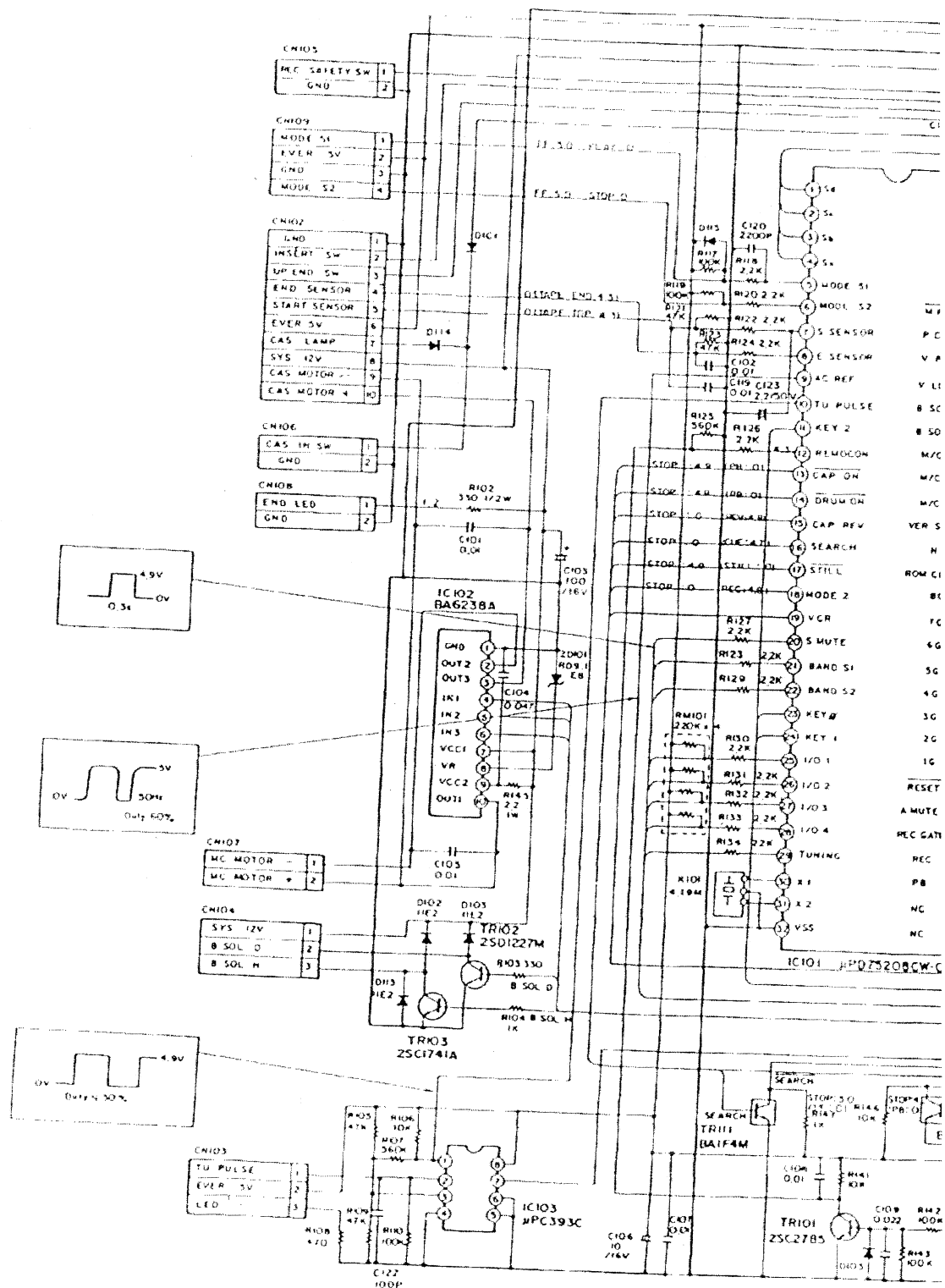
4-1. FRAME WIRING (N9033G)



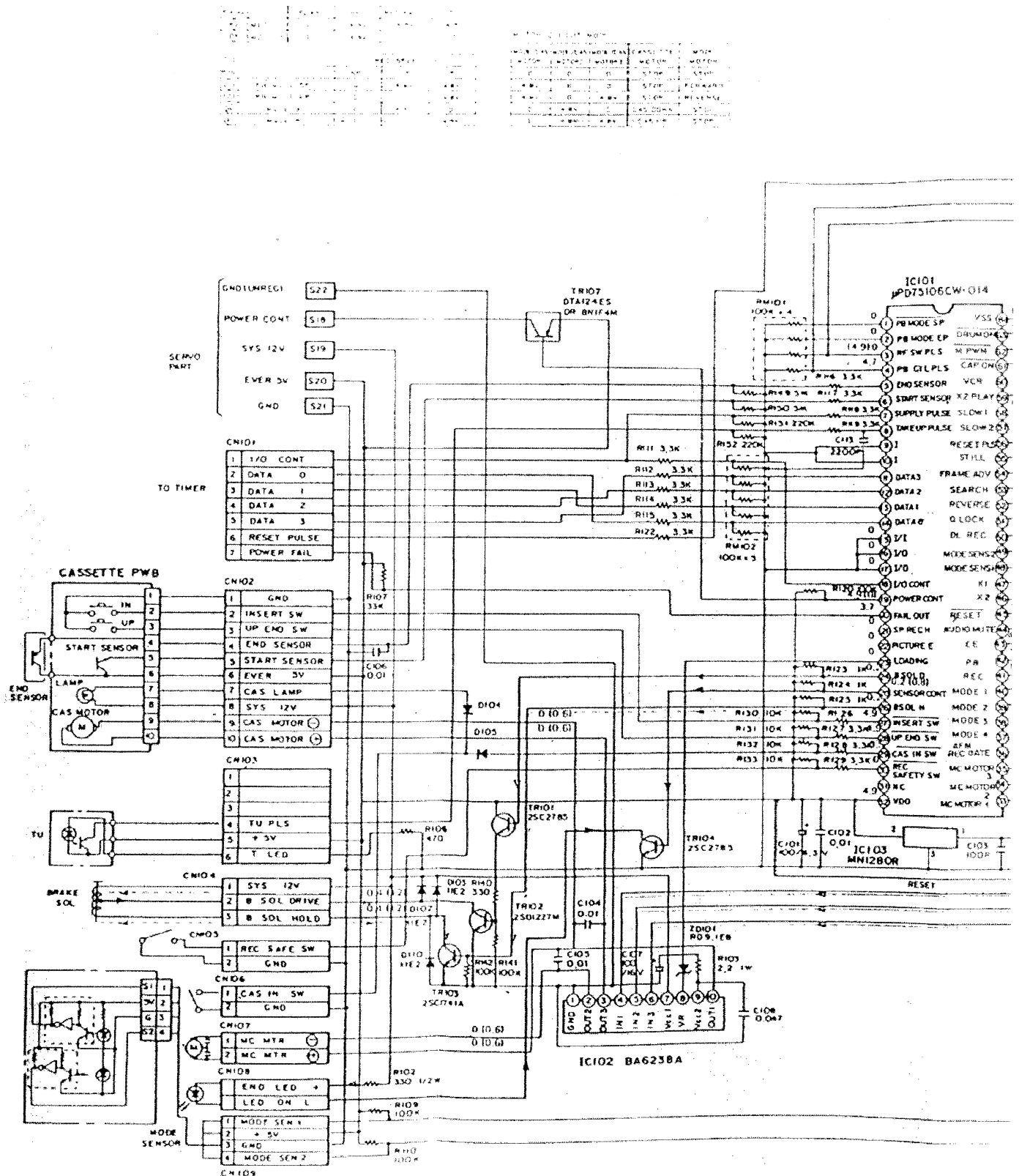
4-2. FRAME WIRING (N9034G)

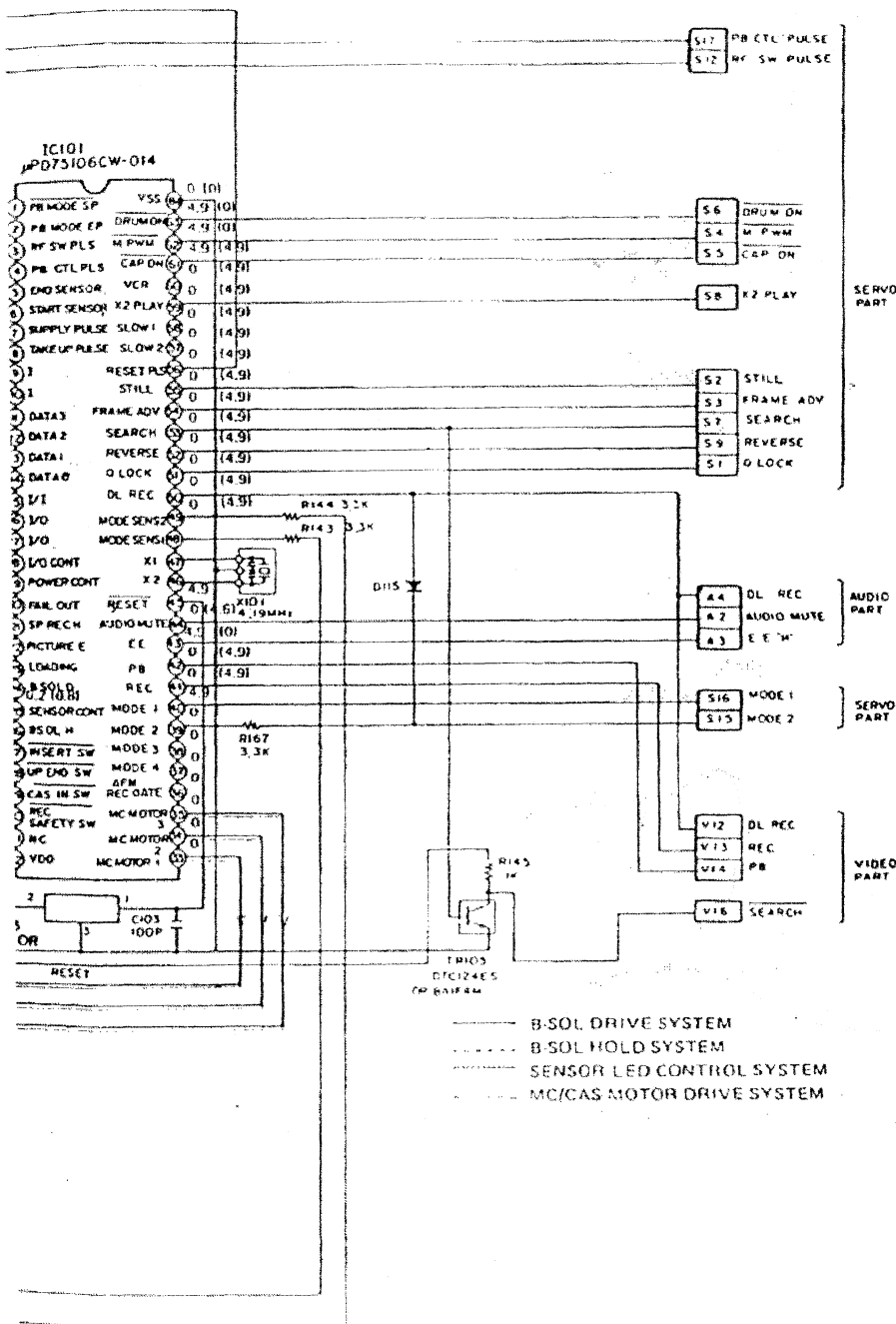
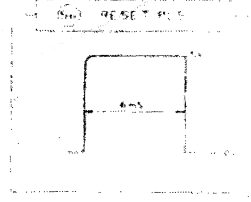
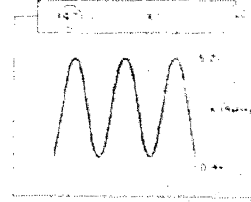
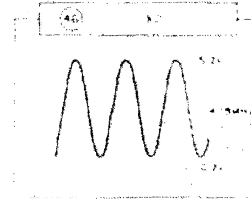
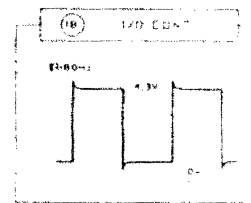
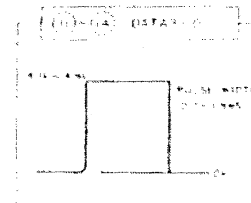
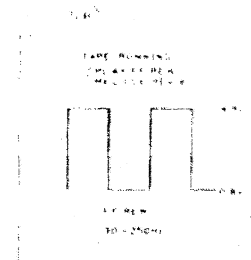
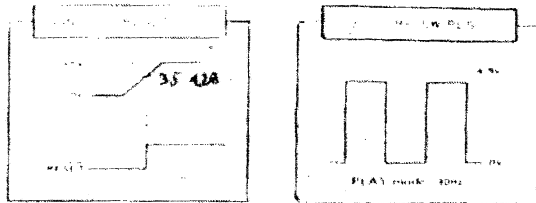


4-3. SYSCON CIRCUIT (N9033G)

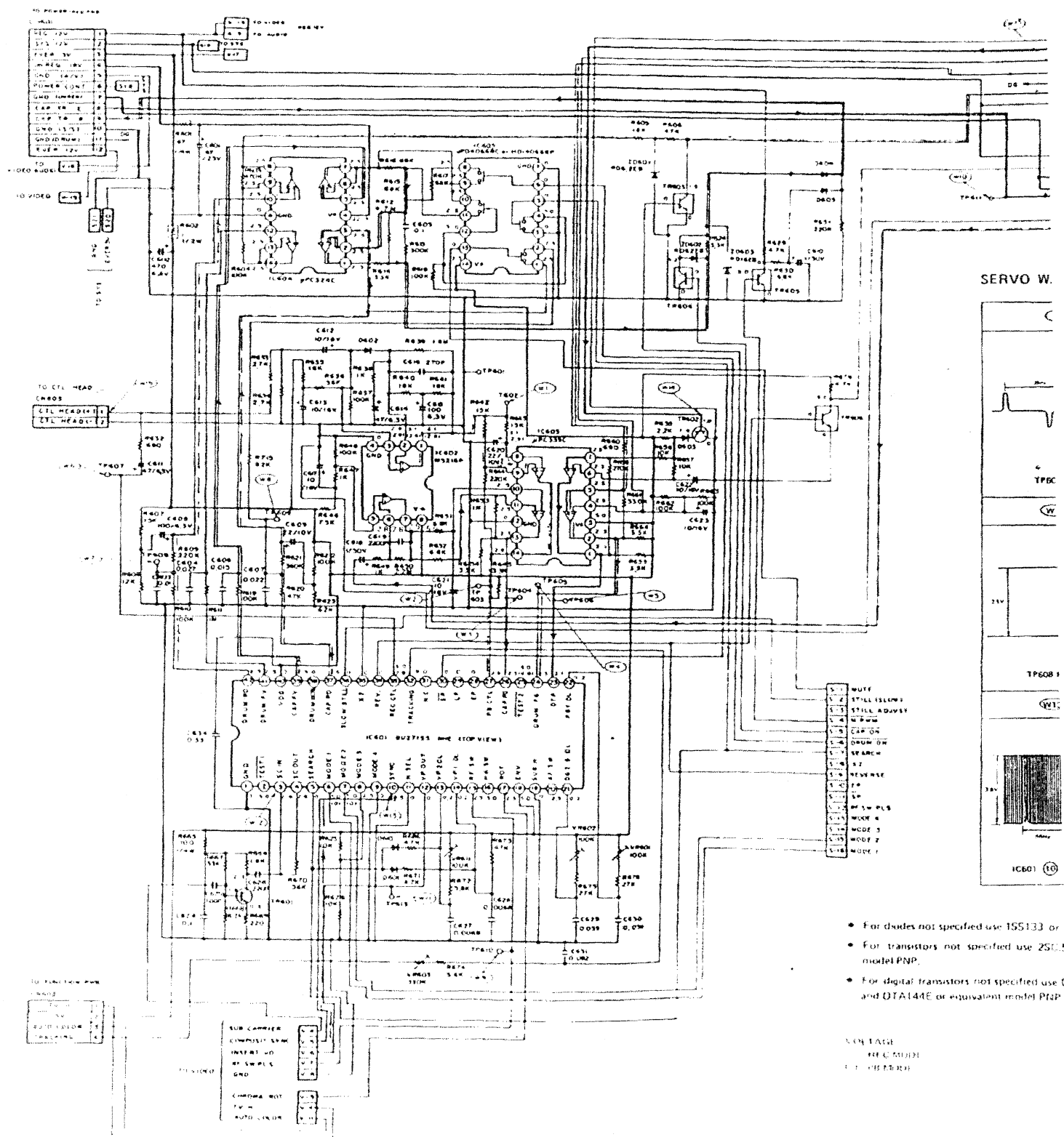


4.4. SYSCON CIRCUIT (N9034G)

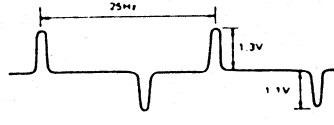
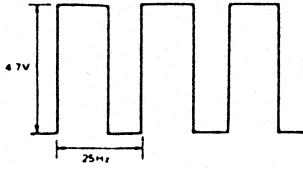
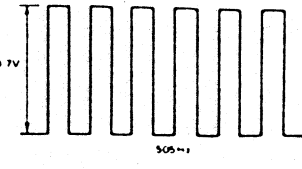
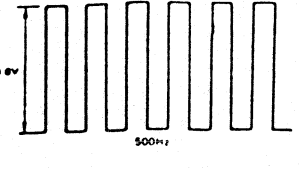
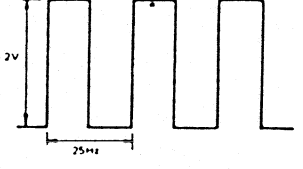
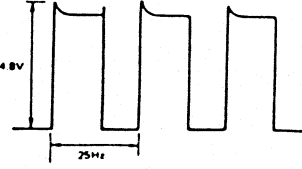
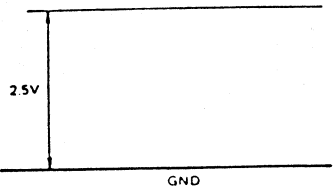
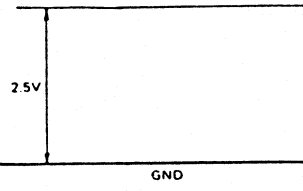
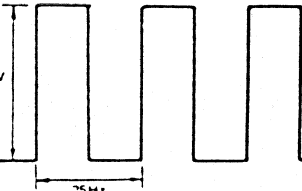
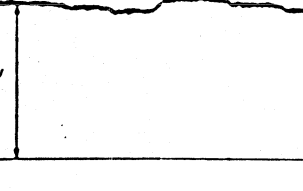
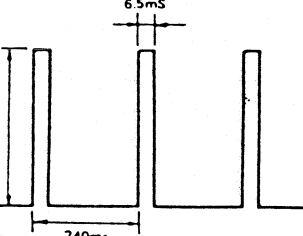
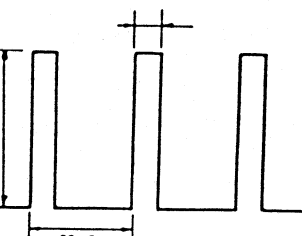
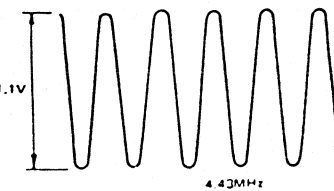
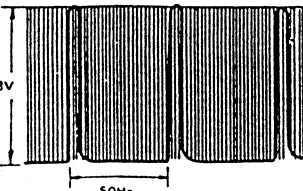
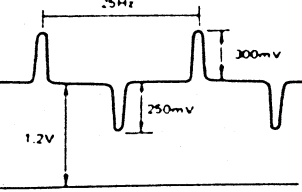
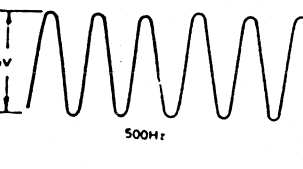
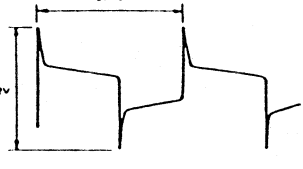




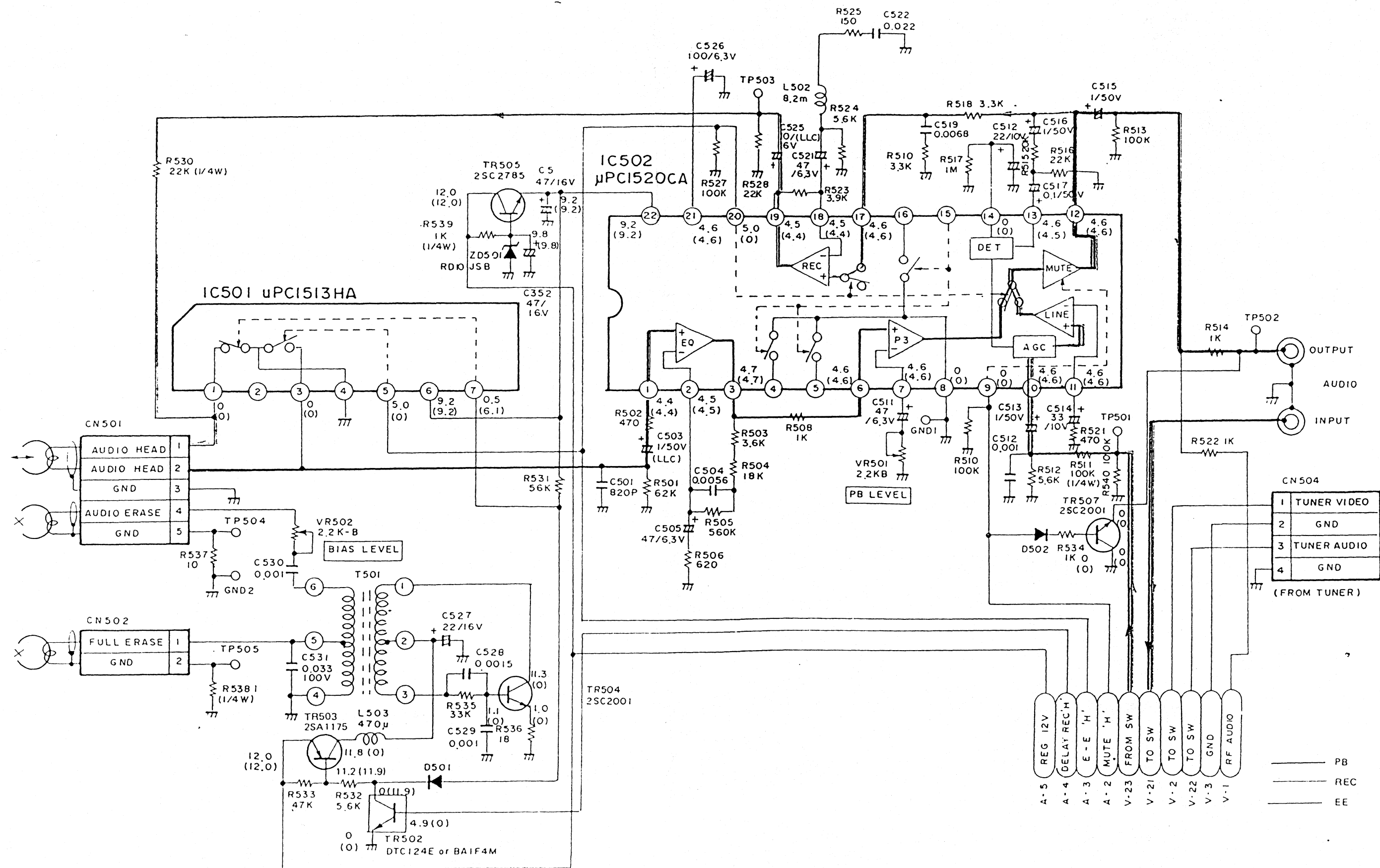
5. SERVO CIRCUIT (N9033G)



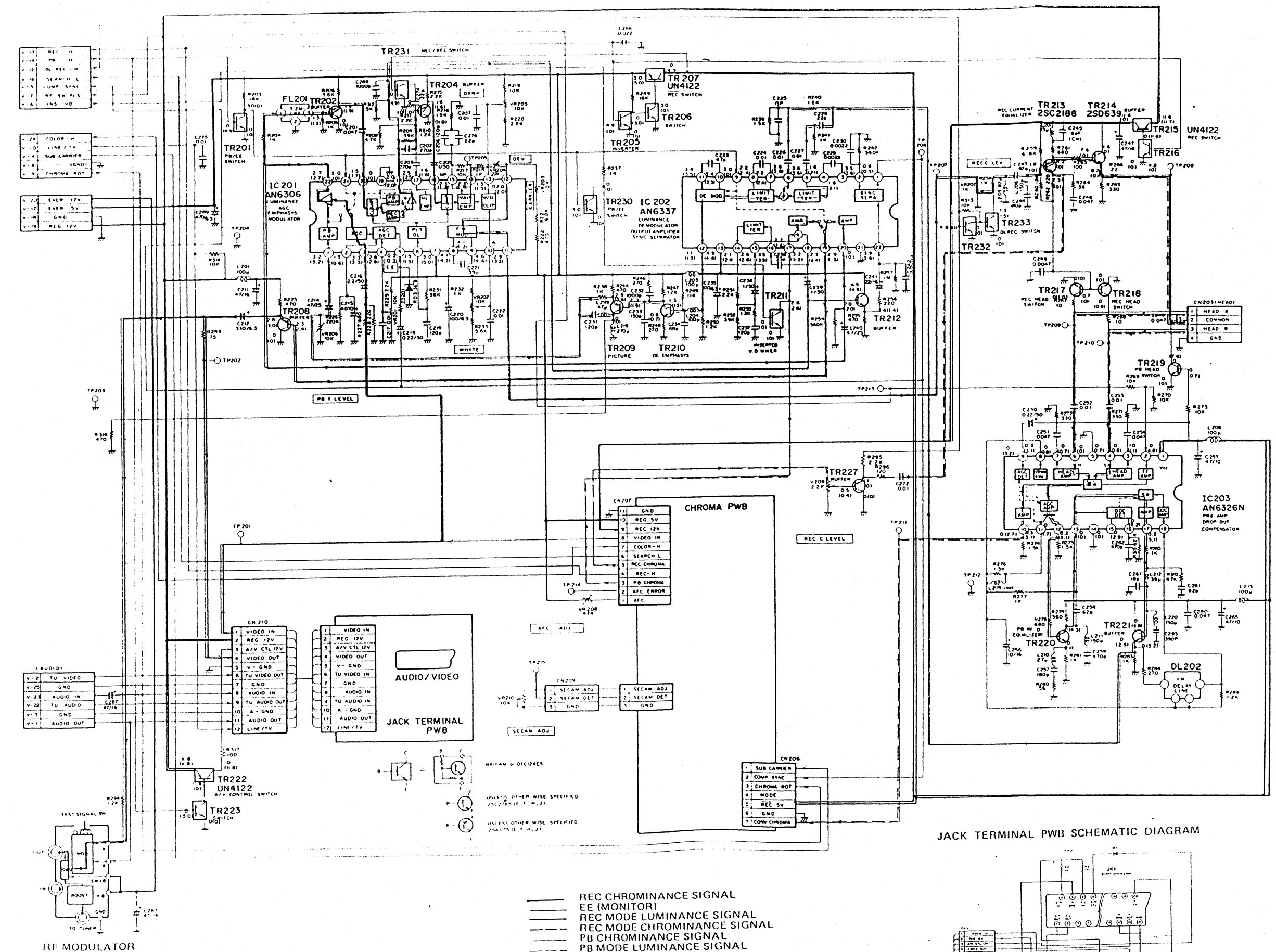
SERVO WAVEFORMS

W1	W2	W3	W4	W5	W6
 TP602 P.B.	 TP603 P.B.	 TP604 REC/PB	 TP605 REC/PB	 TP606 REC/PB	 TP607 REC
W7	W8	W9	W10	W11	W12
 TP608 REC/PB	 TP609 REC/PB	 TP610 REC/PB	 TP611 REC/PB	 TP612 REC/PB	 TP613 STILL
W13	W14	W15	W16	W17	
 IC601 (3) REC/PB	 IC601 (10) REC/PB	 TP601 Base REC/PB	 CN604 (4) REC/PB	 CN603 (1) REC	

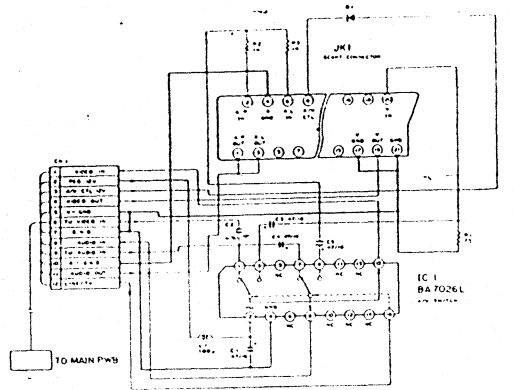
4-7. LINEAR AUDIO CIRCUIT (N9033G/N9034G)



4-8. VIDEO CIRCUIT (N9033G)

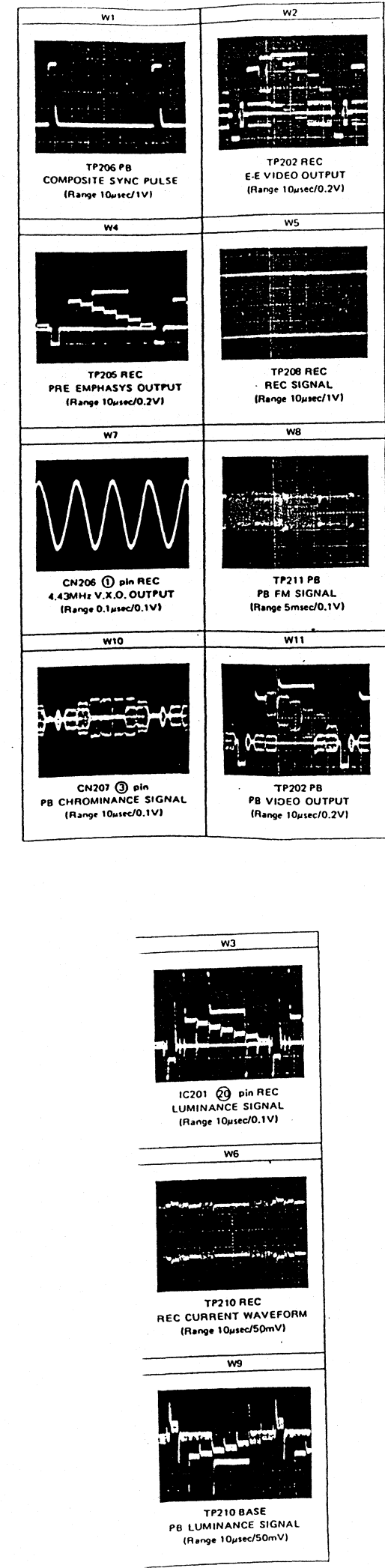


JACK TERMINAL PWB SCHEMATIC DIAGRAM

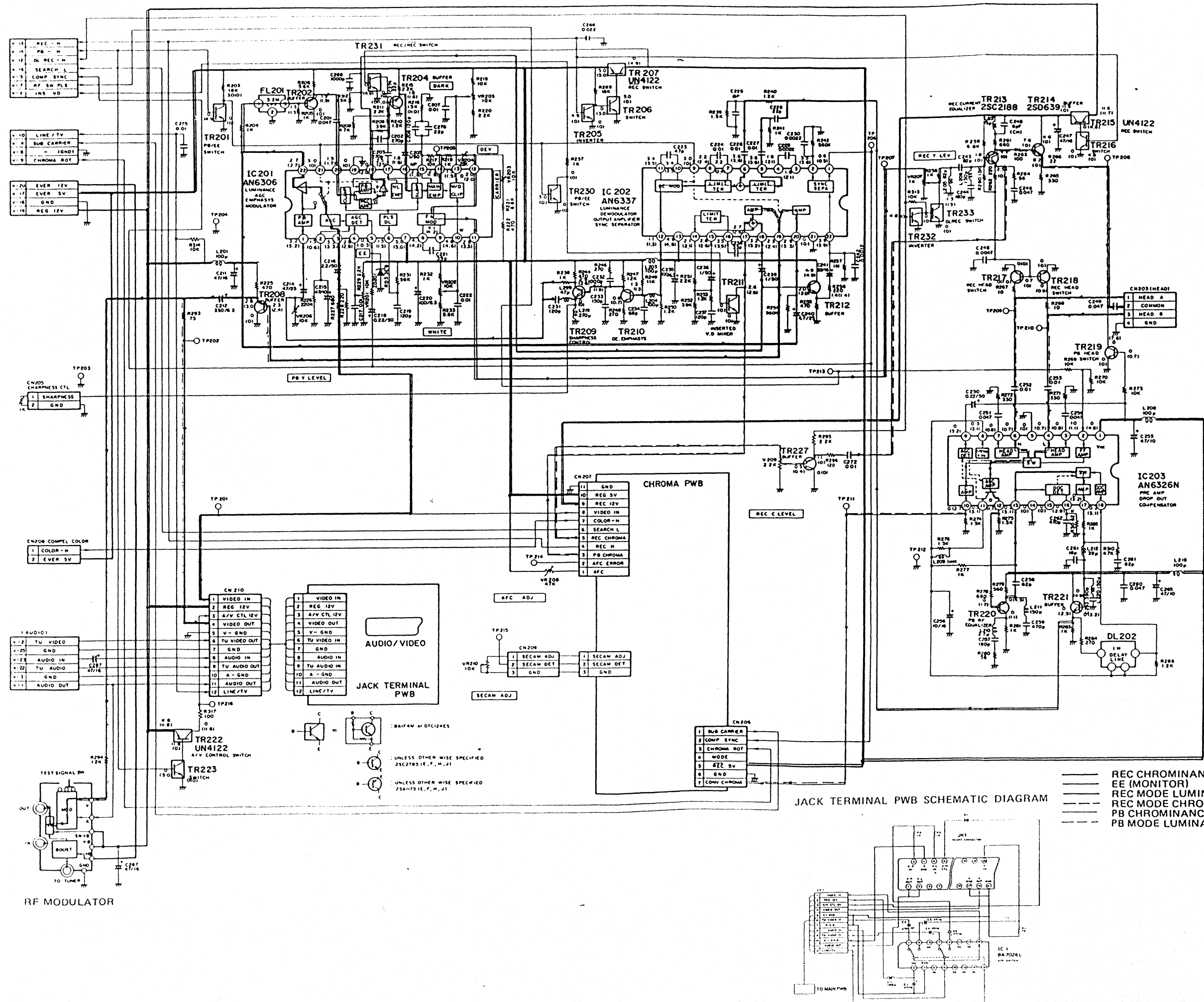


- REC CHROMINANCE SIGNAL
- EE (MONITOR)
- REC MODE LUMINANCE SIGNAL
- REC MODE CHROMINANCE SIGNAL
- PB CHROMINANCE SIGNAL
- PB MODE LUMINANCE SIGNAL

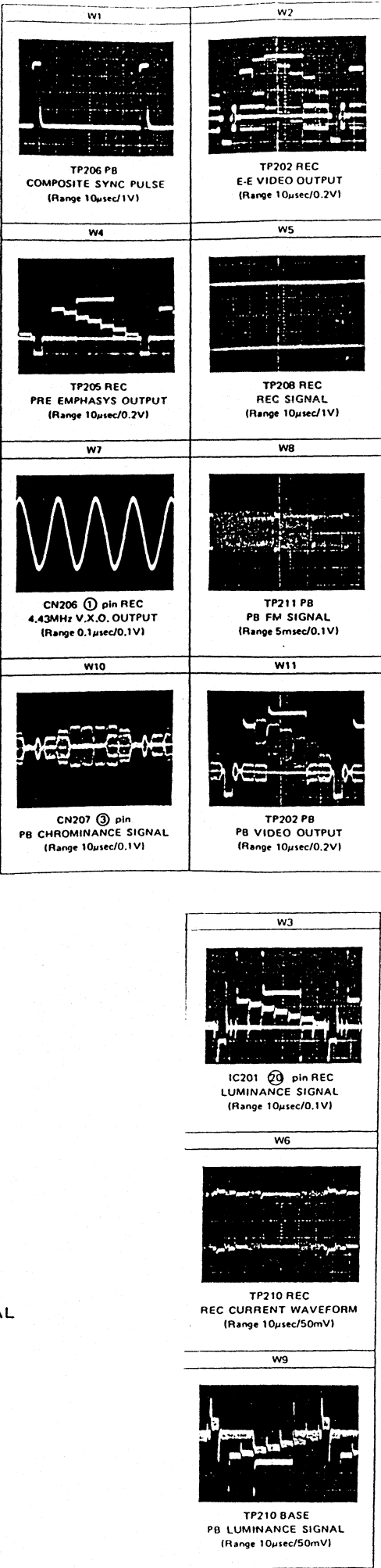
VIDEO WAVEFORMS



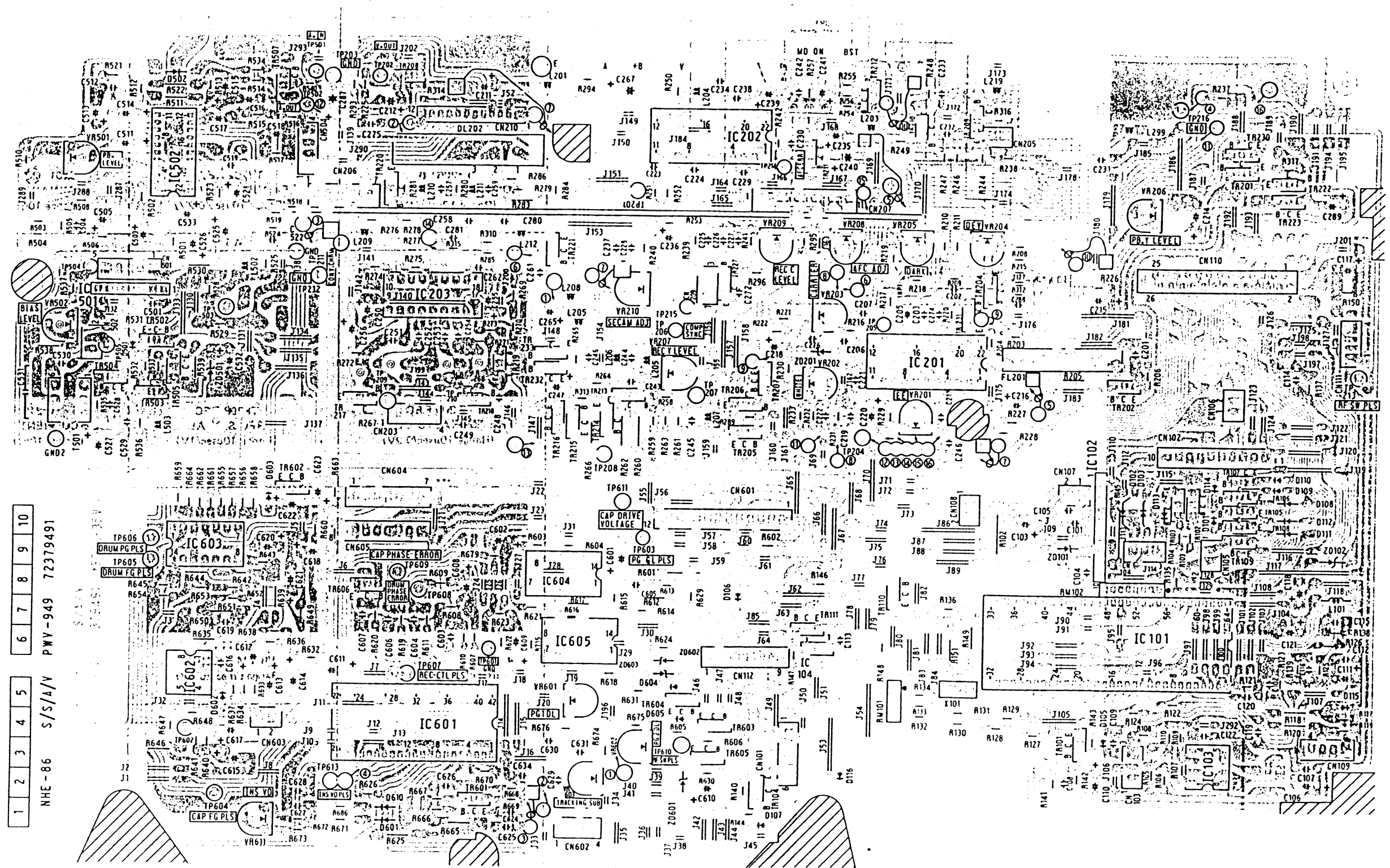
4-9. VIDEO CIRCUIT (N9034G)



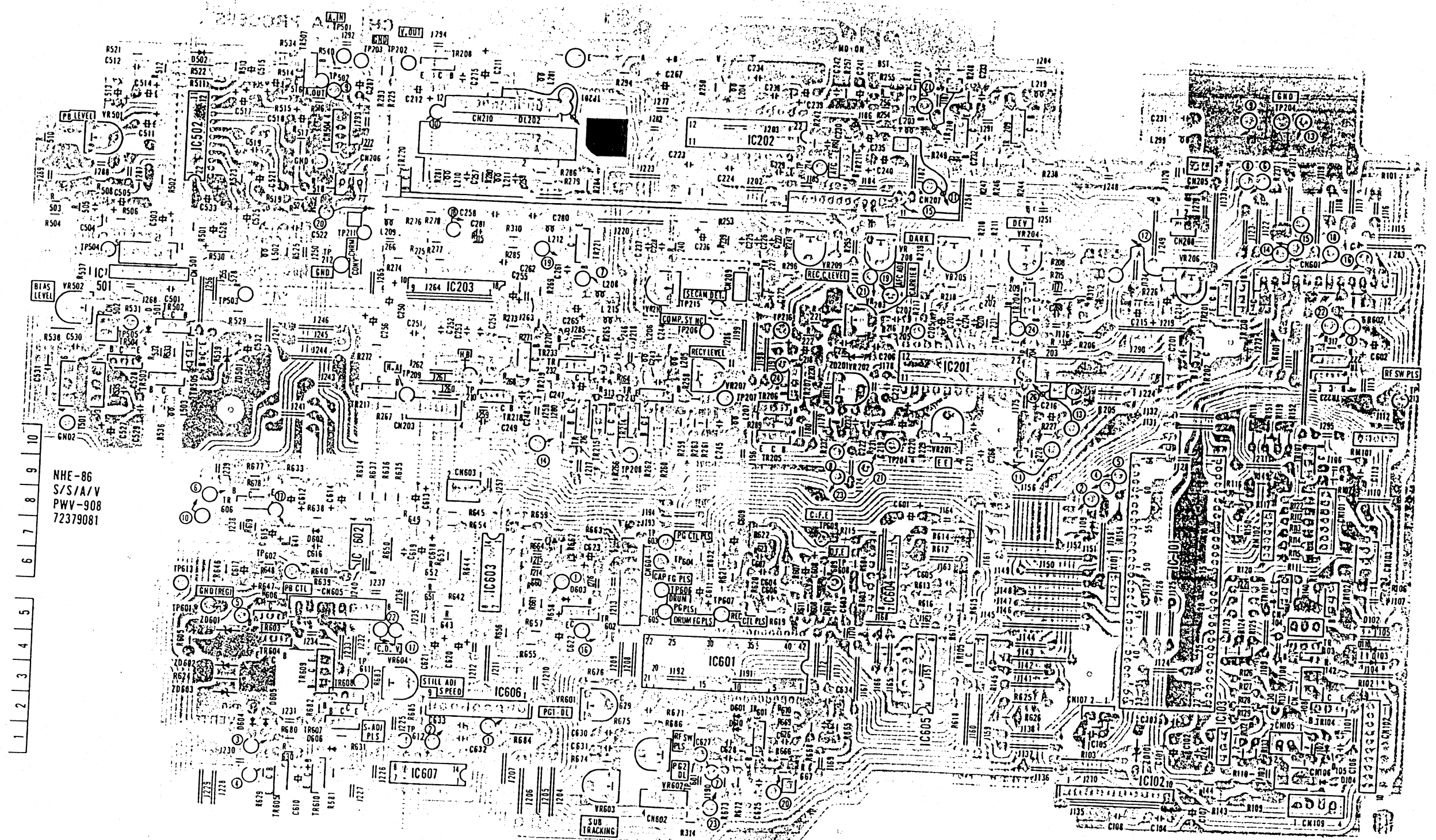
VIDEO WAVEFORMS



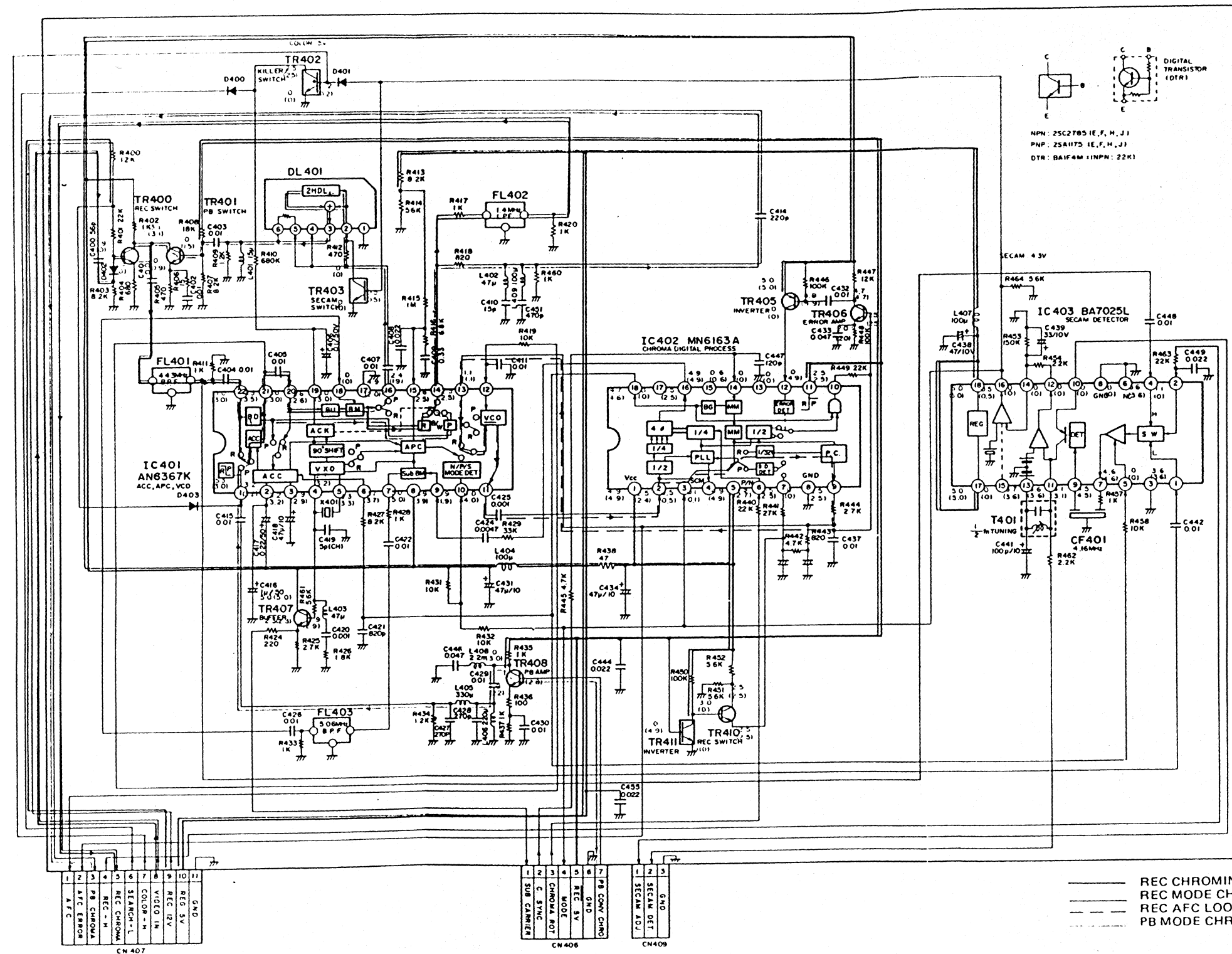
4-10. SYSCON/SERVO/AUDIO/VIDEO CIRCUIT BOARD (SOLDER SIDE) (N9033G)



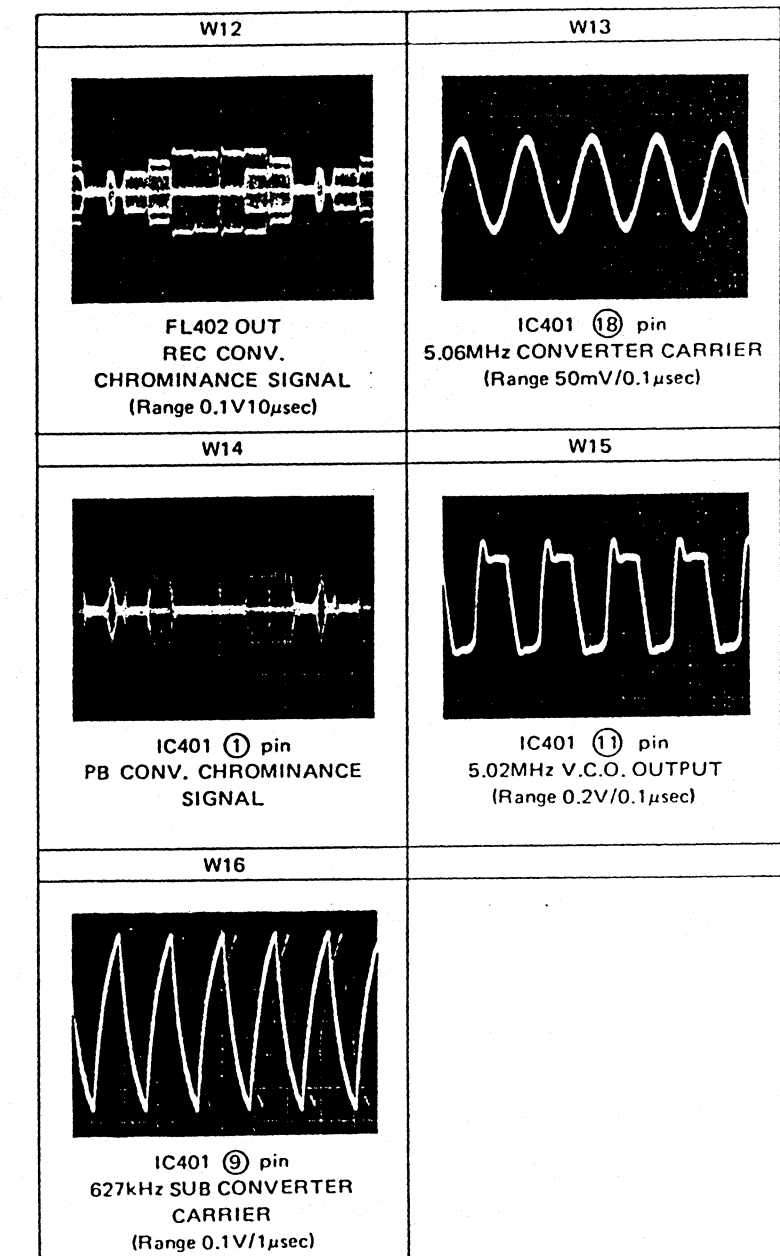
4-11. SYSCON/SERVO/AUDIO/VIDEO CIRCUIT BOARD (SOLDER SIDE) (N9034G)



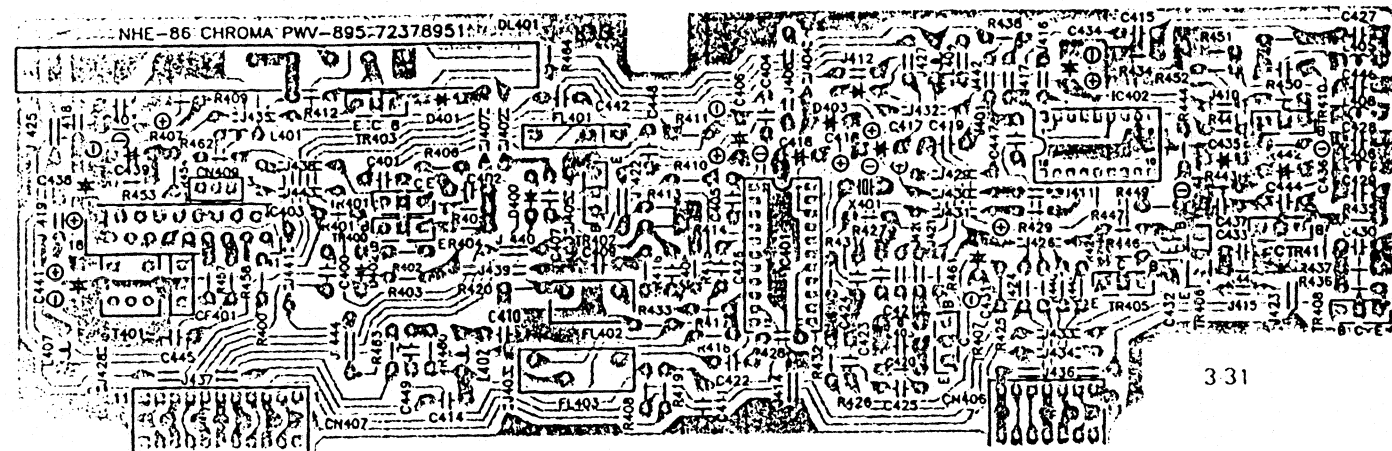
4-12. CHROMA PROCESS CIRCUIT (N9033G/N9034G)



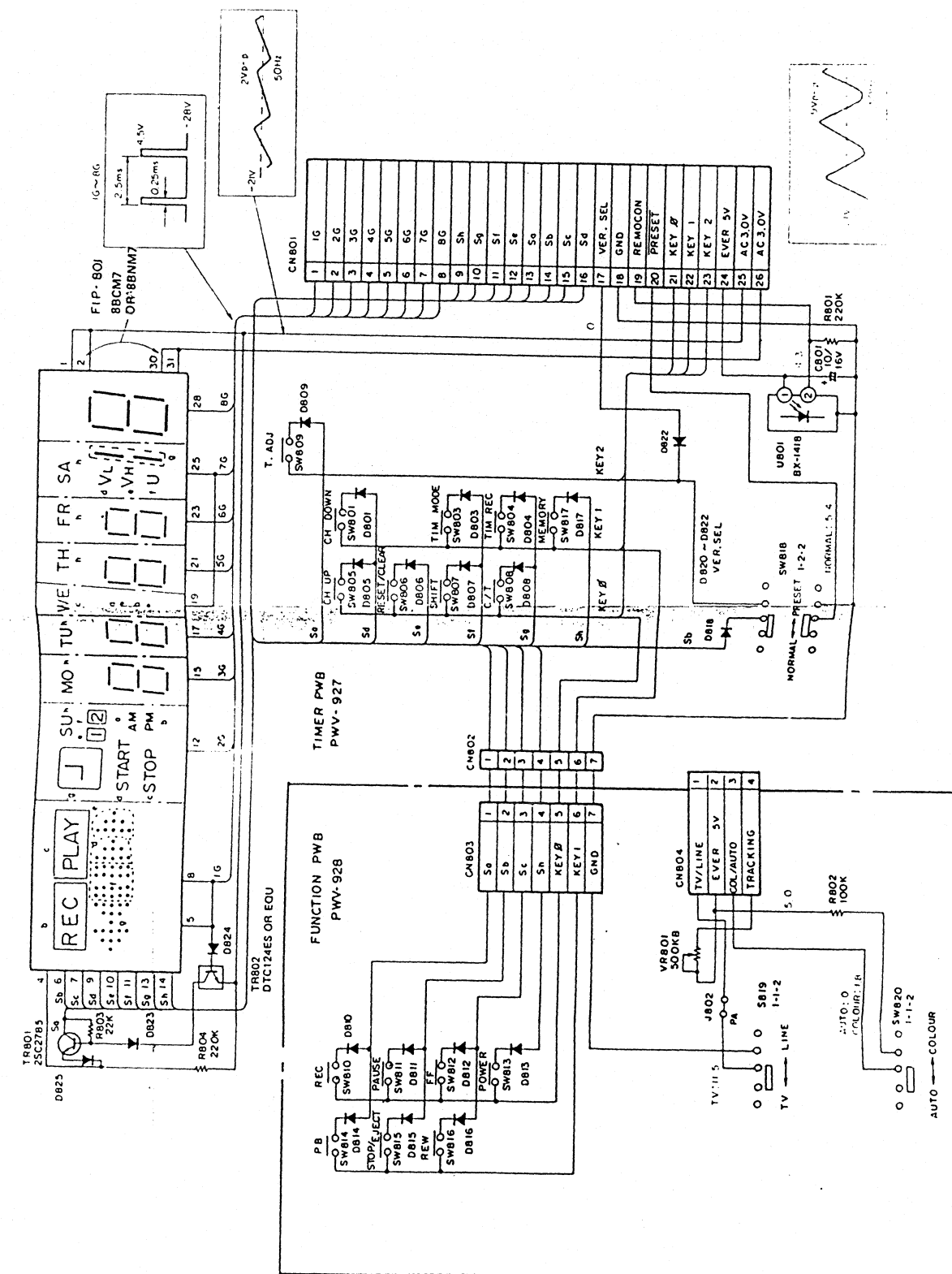
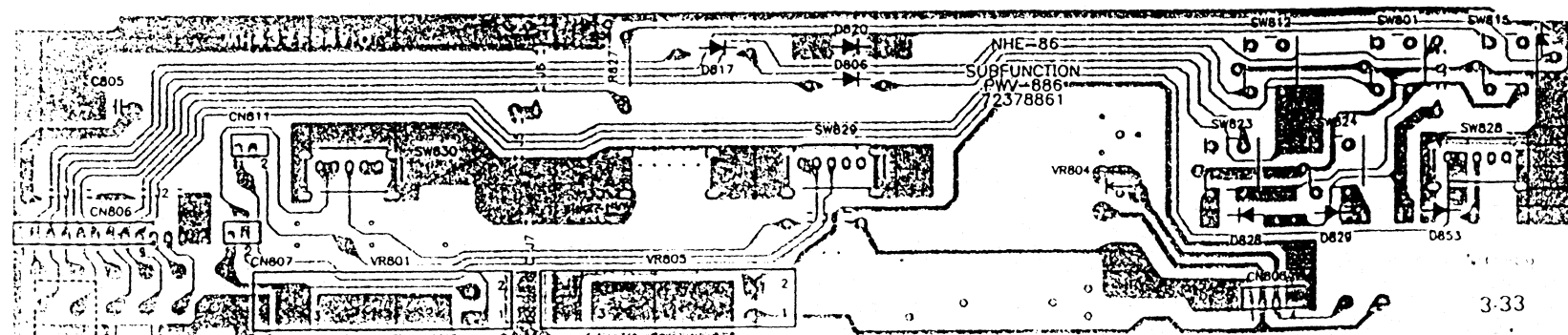
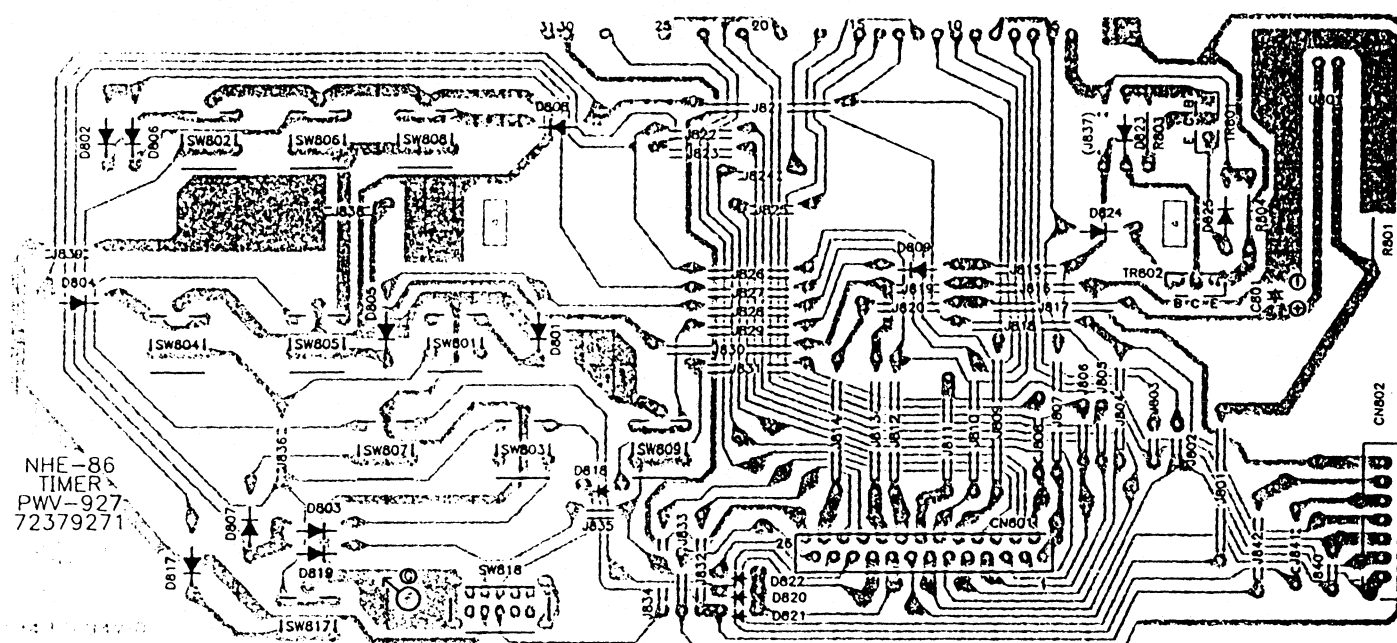
CHROMA PROCESS WAVEFORMS (N9033G/N9034G)



4-13. CHROMA PROCESS CIRCUIT BOARD (SOLDER SIDE)

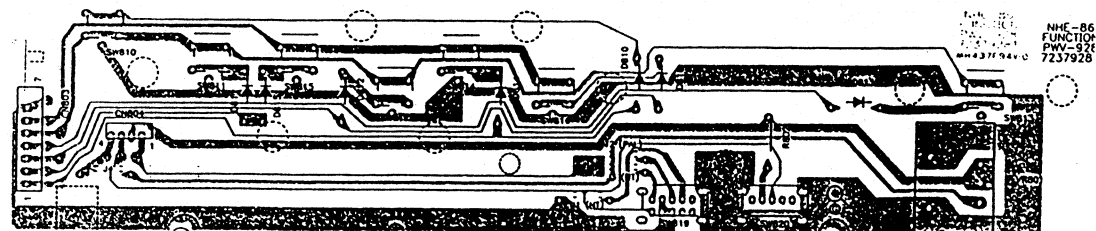
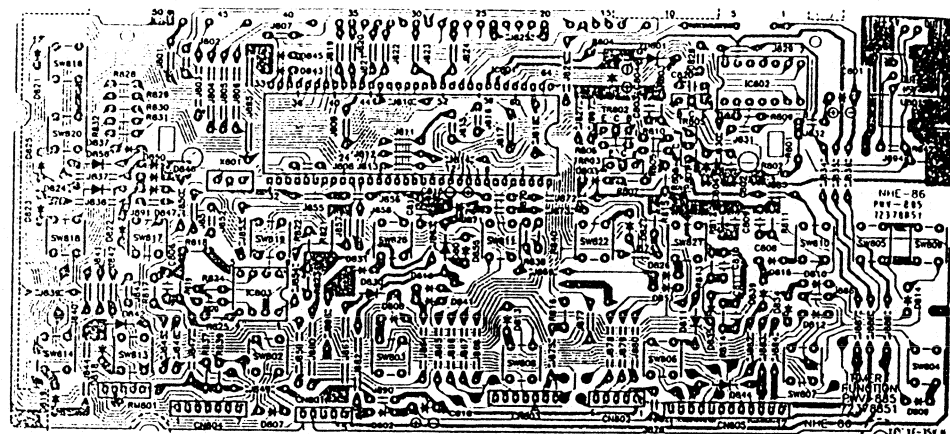


4-15. TIMER FUNCTION CIRCUIT BOARD (SOLDER SIDE) (N9033G)



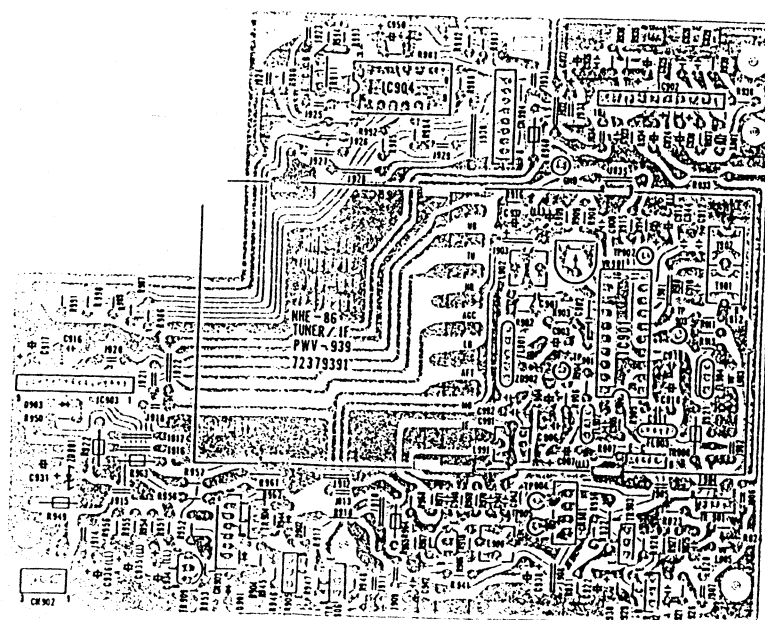
4-14. TIMER FUNCTION CIRCUIT (N9033G)

TIMER SUB-FUNCTION CIRCUIT BOARD (SOLDER SIDE) (N9034G)

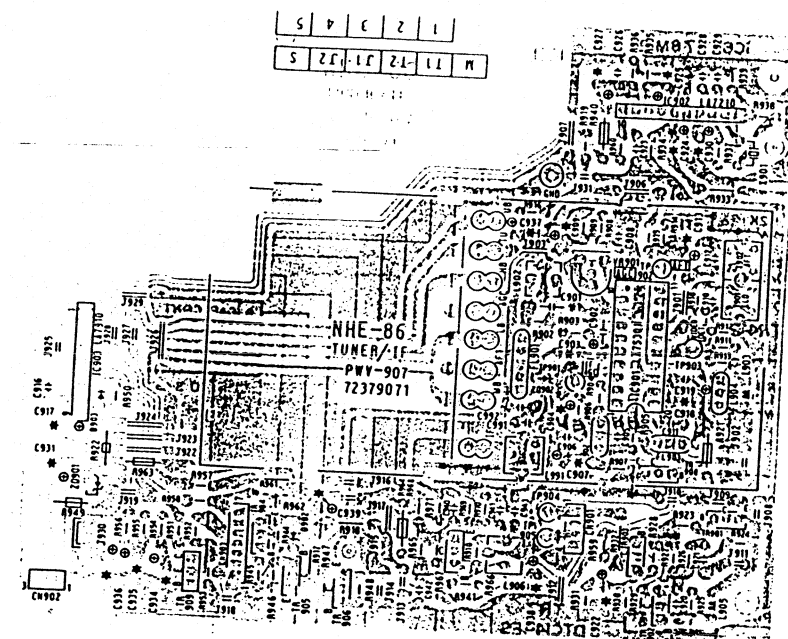


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4-19. TUNER/IF CIRCUIT BOARD (SOLDER SIDE) (N9033G)

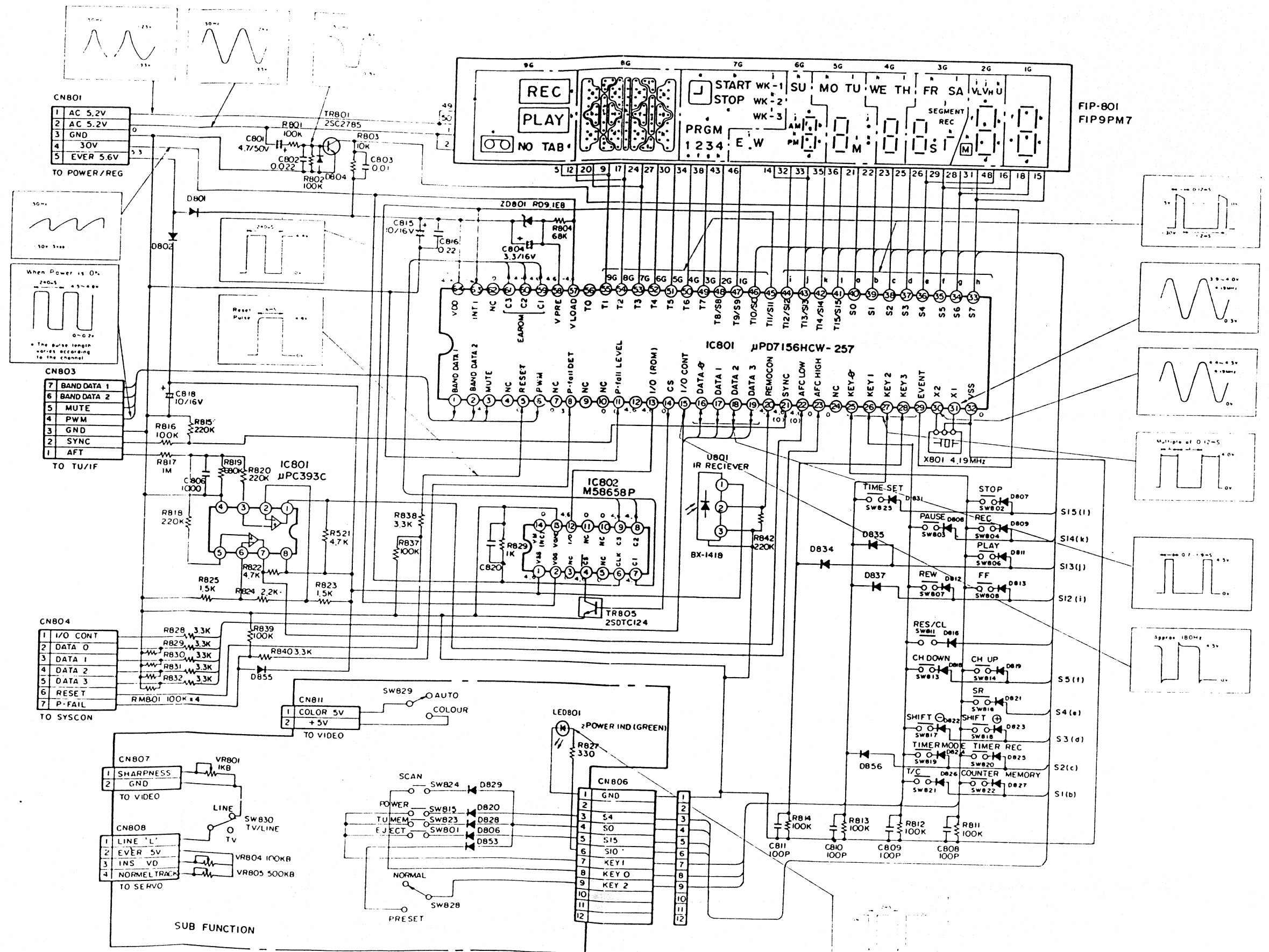


4-21. TUNER/IF CIRCUIT BOARD (SOLDER SIDE) (N9034G)

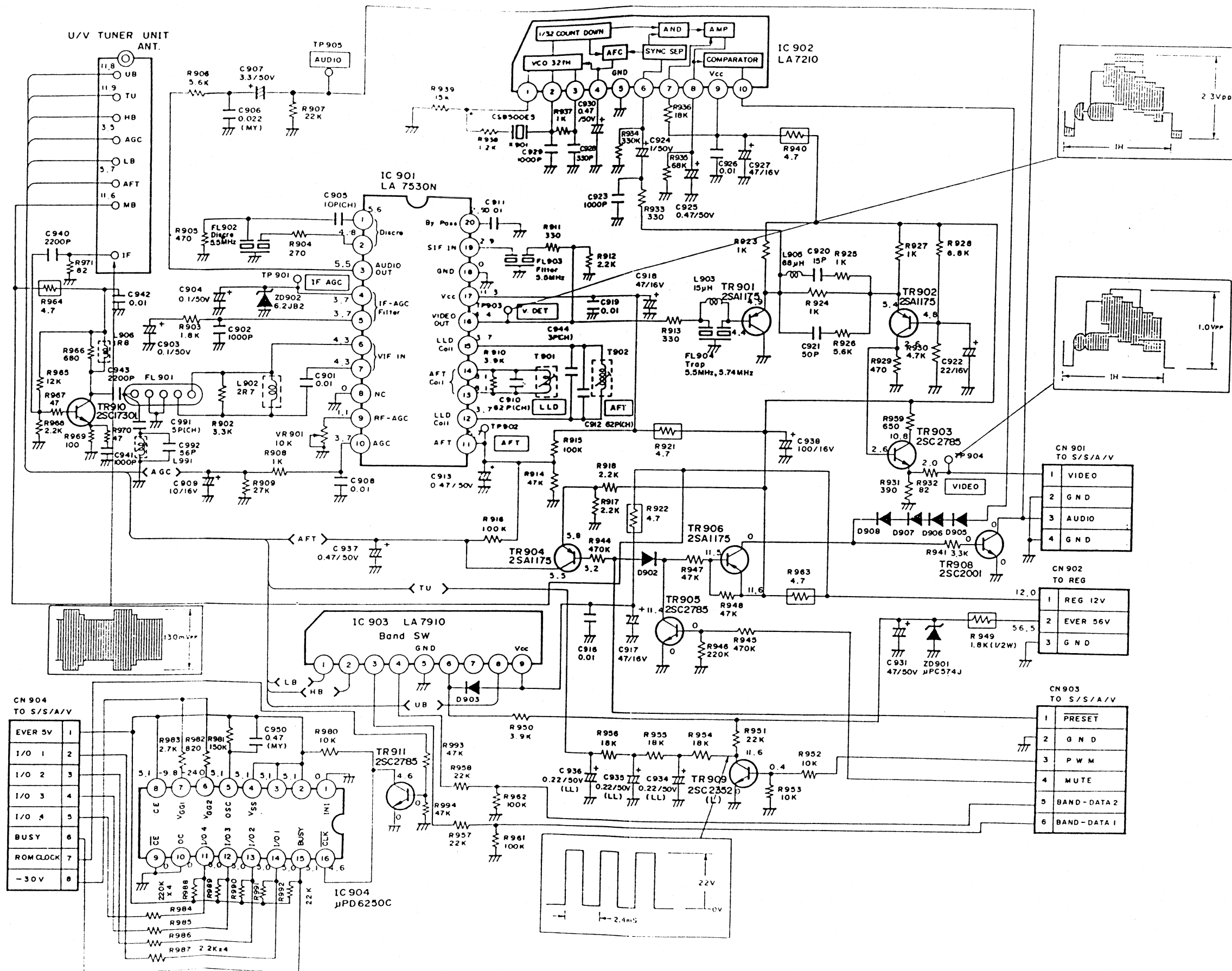


3-39

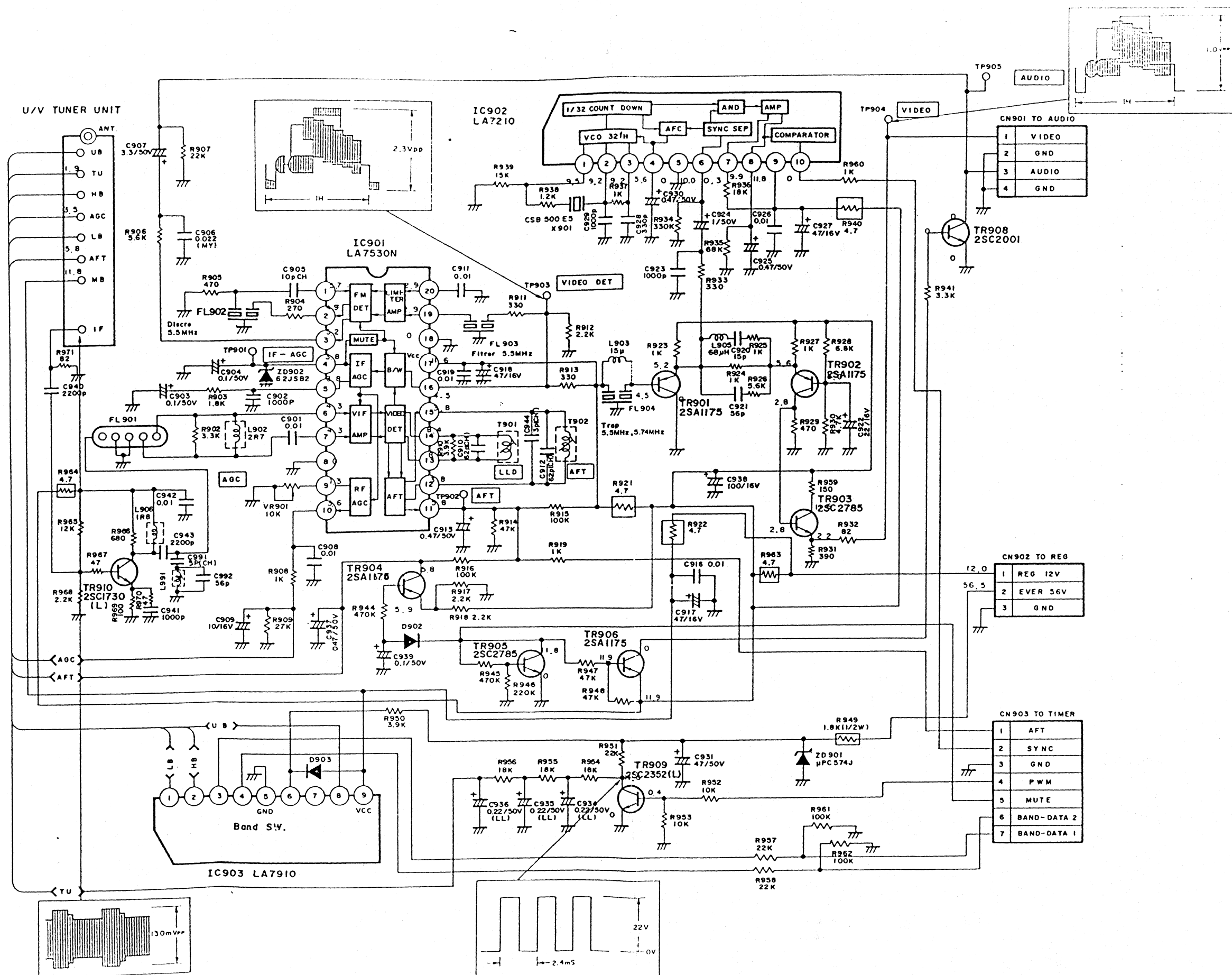
4-16. TIMER SUB FUNCTION CIRCUIT (N9034G)



3. TUNER IF CIRCUIT (N9033G)



4-20. TUNER IF CIRCUIT (N9034G)



4.

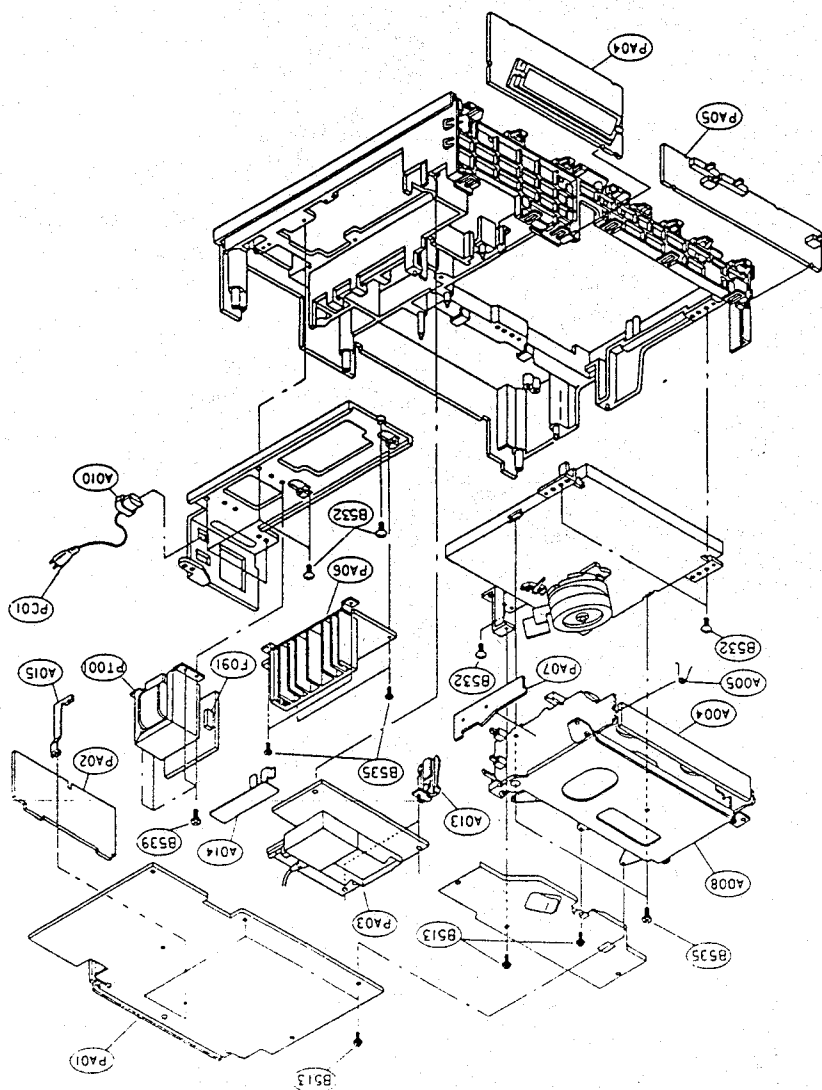


REGULATOR DEPARTMENT
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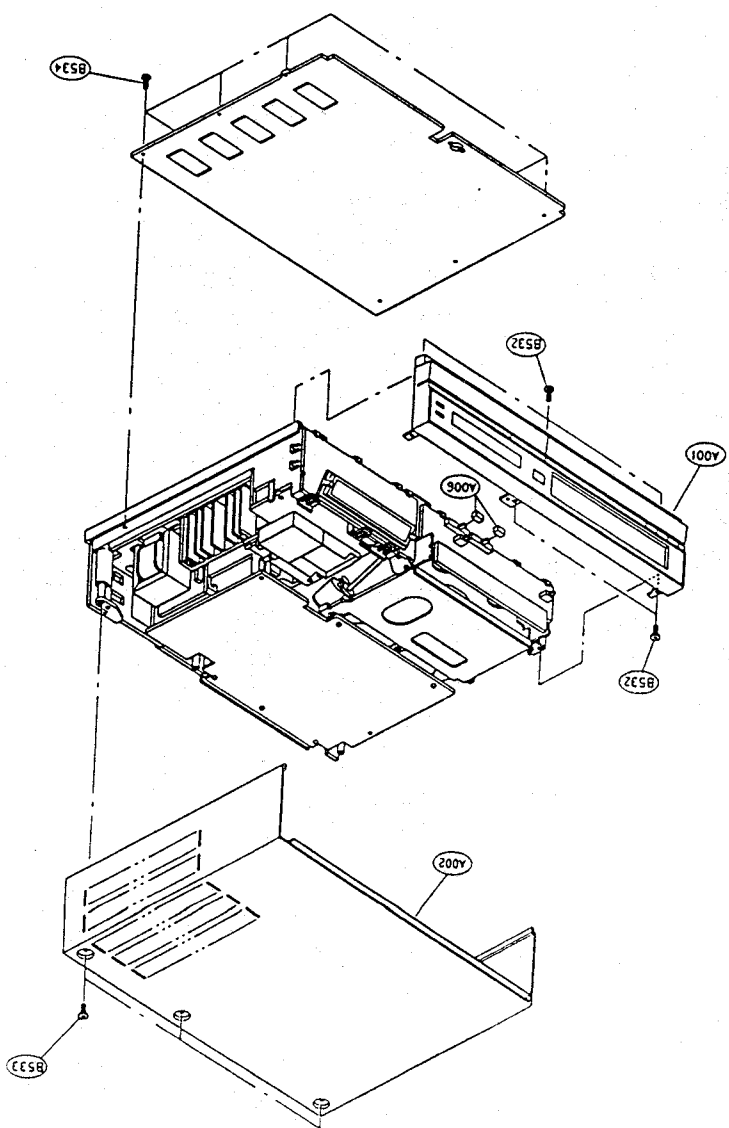
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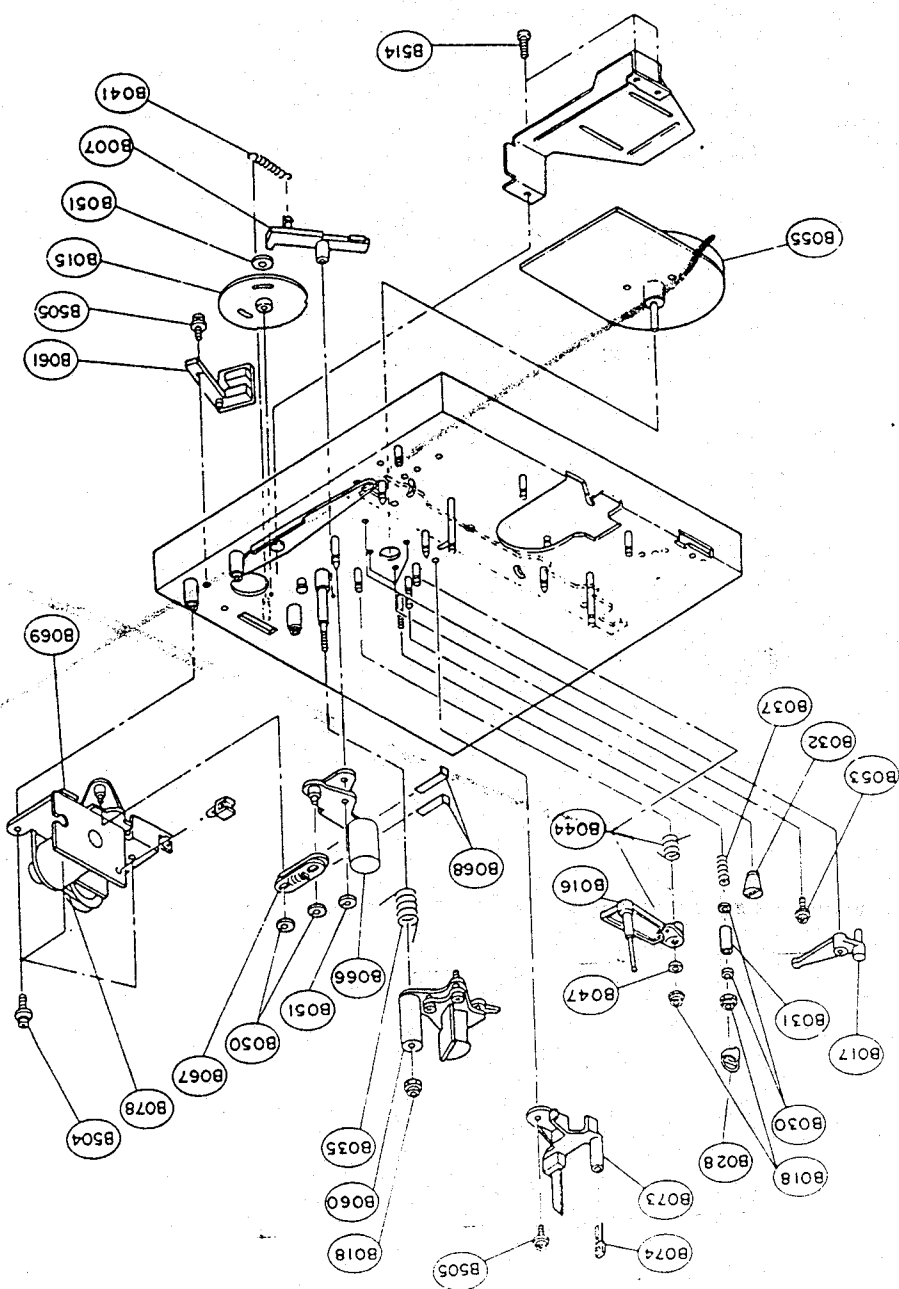
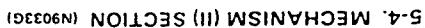
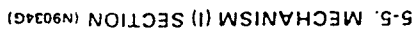
5-3. MECHANISM (I) SECTION (N9033G)



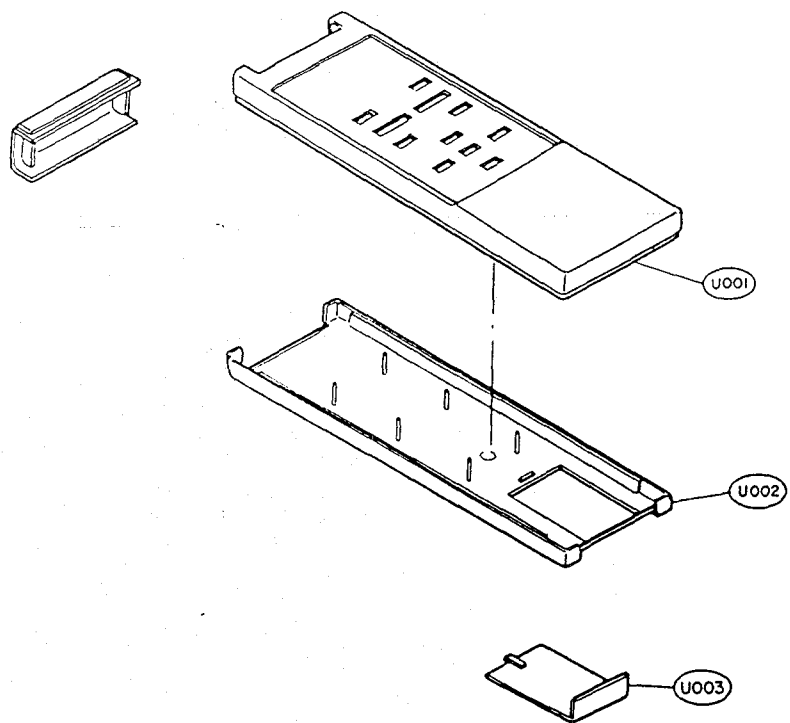
5. EXPLODED VIEWS
5-1. CABINET SECTION (N9033G/N9034G)



5-1. CABINET SECTION (N9033G/N9034G)



5-8. WIRELESS REMOTE CONTROL SECTION (N9033G/N9034G)



WIRELESS REMOTE CONTROL PARTS LIST (N9033G)

SYMBOL	PARTS NO.	DESCRIPTION	Q'TY
U001	18929641	CASE (A) with Label	1
U002	18929651	CASE (B)	1
U003	18929661	CASE (C)	1

WIRELESS REMOTE CONTROL PARTS LIST (N9034G)

SYMBOL	PARTS NO.	DESCRIPTION	Q'TY
U001	18929671	CASE (A) with Label	1
U002	18929681	CASE (B)	1
U003	18929691	CASE (C)	1

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5-9. ACCESSORIES

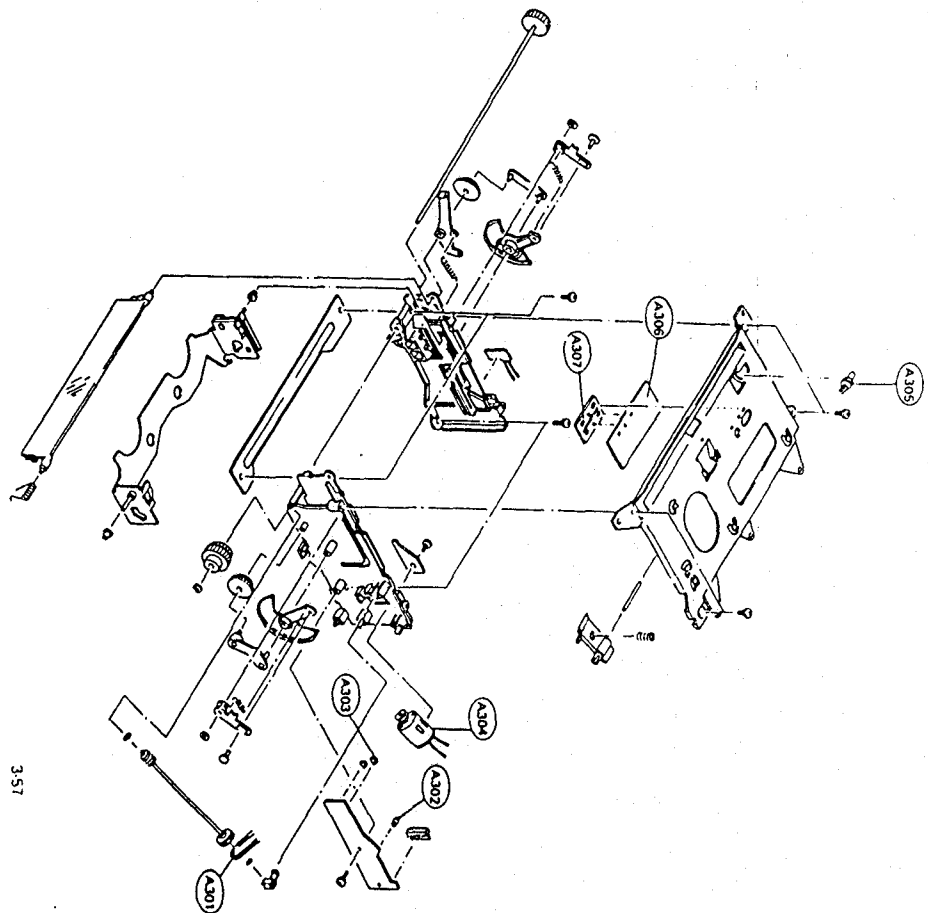
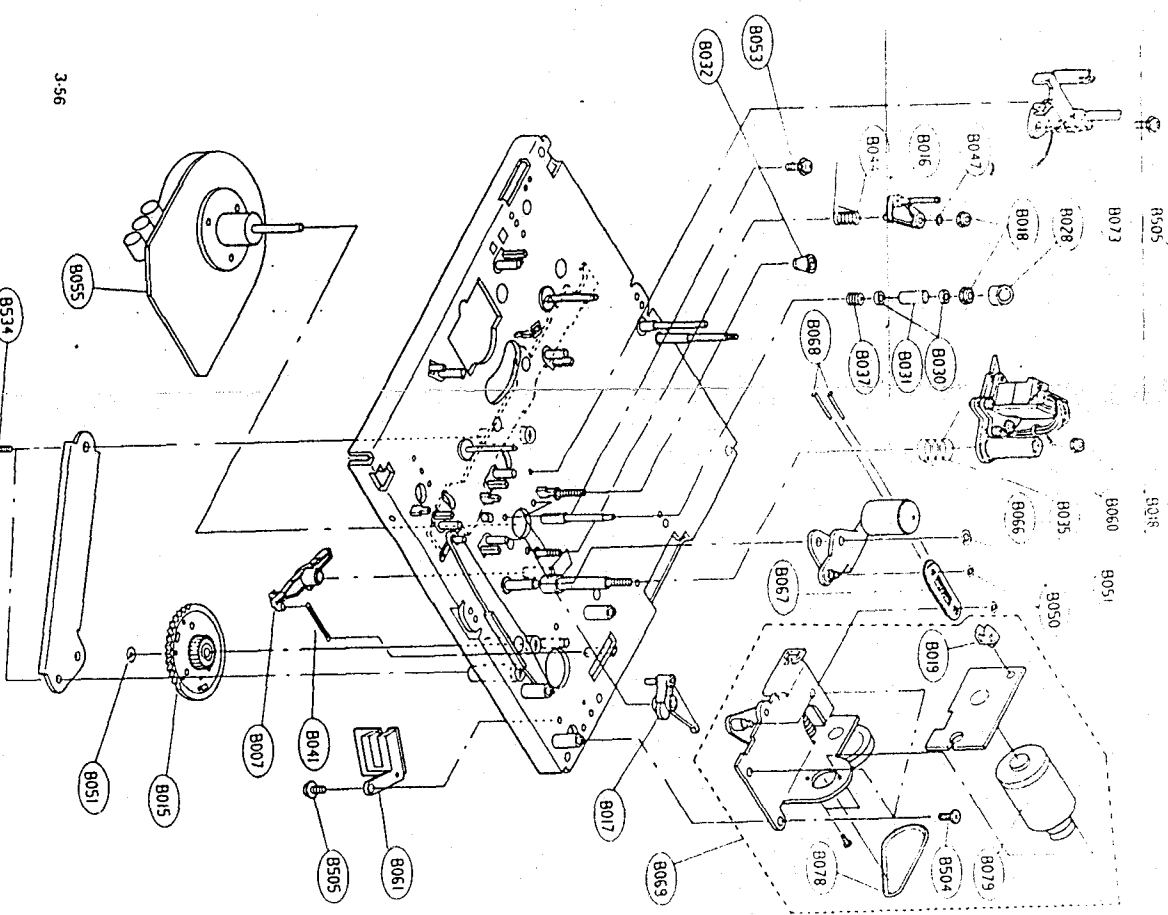
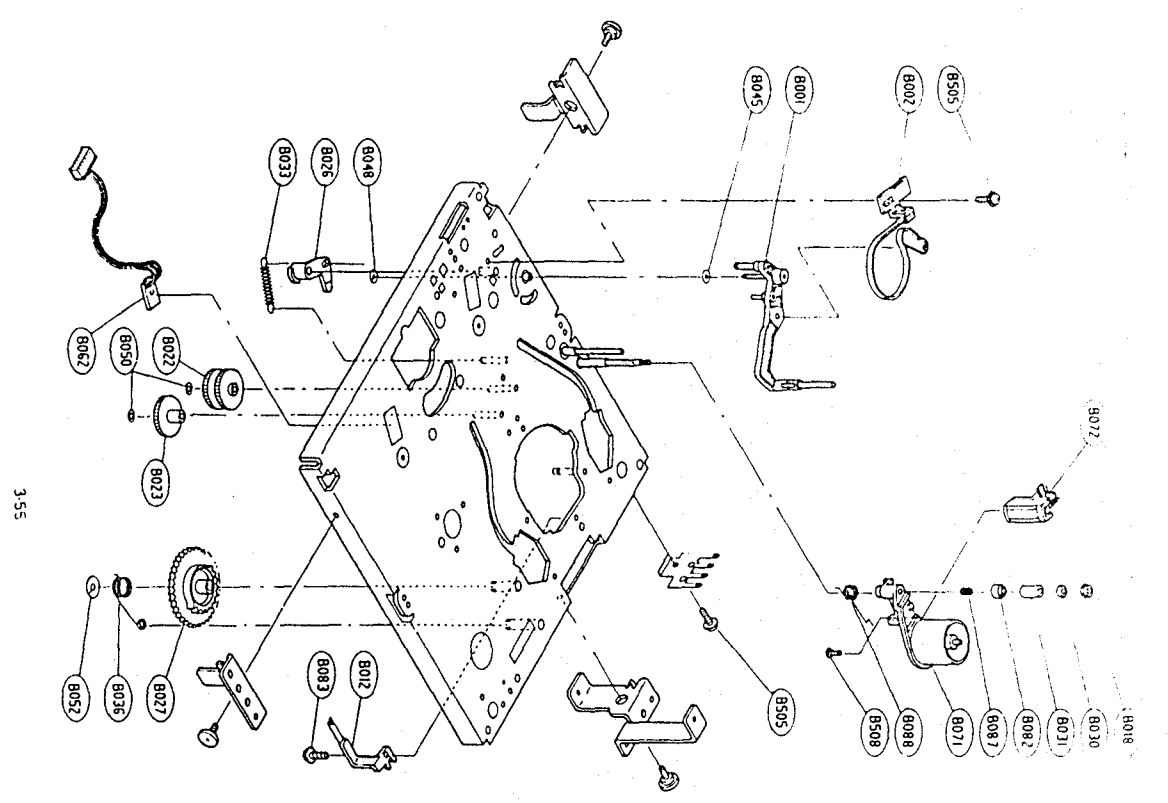
K01	K05	K06

ACCESSORIES PARTS LIST (N9033G)

Ref. No.	Part No.	Description
K01	7881 4901	INSTRUCTION MANUAL N9033G
K05	7955 9054	IEC RF CABLE (1.2M)
K06	7979 9364	WIRELESS REMOTE CONTROL UNIT RB-33P

ACCESSORIES PARTS LIST (N9034G)

Ref. No.	Part No.	Description
K01	7881 4831	INSTRUCTION MANUAL N9034G
K05	7955 9054	IEC RF CABLE (1.2M)
K06	7979 9339	WIRELESS REMOTE CONTROL UNIT RB-34P



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